This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

LANE MEDICAL LIBRARY STANFORD
2 45 0418 2174

REPORT OF THE BOARD of HEALTH OF THE CITY OF NASHVILLE,

1877.

I155
N25

LANE

MEDICAL LIBRARY

LEVI COOPER LANE FUND

SECOND REPORT

OF THE

BOARD OF HEALTH

TO THE

LANE LIBRARY

HONORABLE CITY COUNCIL

OF THE

CITY OF NASHVILLE,

For the Year ending July 4, 1877.

NASHVILLE, TENN.:
TAVEL, EASTMAN & HOWELL.
1877.

LANE LIBRARY

ORGANIZATION.

J. D. PLUNKET, M. D.
J. B. W. NOWLIN, M. D.
JOHN A. DRAUGHON, M. D.
J. R. BUIST, M. D.
THOMAS A. KERCHEVAL, MAYOR, *ex-officio.*

J. R. BUIST, M. D., *President.*
J. B. W. NOWLIN, M. D., *Secretary.*

OFFICERS OF THE BOARD.

Health Officer:
J. BERRIEN LINDSLEY, M. D.

Sanitary Inspectors:
B. M. HAWKINS. MARTIN KERRIGAN.

Scavenger Boss:
WILLIAM P. STONE.

26990

CONTENTS.

I. Report on Sanitary Reform in Nashville, with Mortuary Statistics for 1875 and 1876. By J. Berrien Lindsley, M. D., Health Officer..... 9

II. On the Topography of Nashville. By Wilbur F. Foster, City Engineer..... 133

III. On the Geology of Nashville, by James M. Safford, Ph. D., M. D., Geologist of Tennessee, and Professor of Chemistry in the Medical Department of the University of Nashville and of Vanderbilt University..... 145

IV. On the Water Supply of Nashville. By Nathaniel T. Lupton, M. D., LL. D., Professor of Chemistry in Vanderbilt University 153

V. On the Climate of Nashville. By Albert C. Ford, M. D., United States Signal Service Observer..... 171

VI. Brief Annals of Nashville. By Anson Nelson, Secretary of the Tennessee Historical Society..... 183

VII. Analytical Index. By George S. Blackie, M. D., Ph. D., Professor of Chemistry in the Nashville Medical College..... 217

To the Hon. Mayor and City Council:

GENTLEMEN: I have the honor herewith to transmit for your information this, "The Second Report" of the Board of Health, embodying the Health Officer's able and exhaustive report, and tabulated statistics of mortality for the years 1875 and 1876, inclusive; together with other valuable papers bearing upon the sanitary condition and progress of the city of Nashville.

Trusting that the accompanying reports will afford a satisfac-factory exhibit of the workings of the Health Department of your City Government for the term therin embraced, I am very respectfully,

Your obedient servant,

J. R. BUIST, M. D., *President.*

Nashville, Tenn., August, 1877.

Resolved, That the Board of Health, while formally accepting and publishing the accompanying report, does not hold itself responsible for any opinions, theory or criticisms therein contained, but as every such paper is published over the signature of its writer, who is entitled to the credit of its production, the responsibility for its statements of facts and opinions must rest there also.

SANITARY REFORM IN NASHVILLE.

WITH MORTUARY STATISTICS FOR 1875 AND 1876.

A Report made to the Board of Health of the City of Nashville, by J. BERRIEN LINDSLEY, M. D., *Health Officer.*

To the President and Members of the Nashville Board of Health:

GENTLEMEN: I have the honor herewith to present to the

ERRATA.

Page 71, for "B. F. Morton," read "B. F. Manlove."

Page 81, for "W. Ewing," read "Wm. G. Ewing."

Page 85, for "Elisha Hall," read "Elisha Harris."

Page 94, for "T. H. P. Pool," read "E. F. P. Pool."

out in actual life must be given, and not essays touching all around a subject.

It is simple justice to state that the composition of this report has been mainly a work for the month of July, without intermitting daily attention to office registration and hospital calls. But for the faithful assistance of the Sanitary Inspectors in compiling

the various tables, and of a competent amanuensis, it would have been a physical impossibility to have finished the labor within the time assigned.

With great satisfaction I also transmit herewith the accompanying reports upon special topics by my distinguished collaborators, the City Engineer, the State Geologist, and the Professor of Chemistry in Vanderbilt University. When it is considered that these gentlemen are all experts, whose time is fully occupied, and whose special services at all times command high fees, these voluntary contributions to your objects are highly significant, as proving that the culture and science of Tennessee are heart and hand with the medical profession in the great work of promoting Public Hygiene and Preventive Medicine.

To the skilled meterologist connected with that beneficent arm of Government, the United States Signal Service, we are indebted for the fullest article yet printed on the climate of Nashville. It is the fruit of much laborious research. To round off our work for strangers and new comers, the best informed local historian has taken time, in the midst of pressing official duties, to arrange brief but elaborate "Annals." A distinguished scholar has given much labor in preparing an exhaustive index, without which, as Allibone well and frequently maintains in his famous "Dictionary of Authors," books filled with facts have no right to see the light.

NASHVILLE, August 7, 1877.

ON SANITARY REFORM IN NASHVILLE.

Hygiene, or more properly civilization, of which it is a phase, may be summed up in two words: morality, comfort.—*Levy.*

Medical science has been, and is to be, for centuries to come, a mighty moral agent, which, in its application to social and political economy, promises the most brilliant results. We may mention the arrest and extinction of epidemics as one of these. The application of an efficient medical police to our larger towns, by the establishment of "Boards of Health," with the requisite powers, may be reckoned as one of the most important results accomplished by the social influence of the profession.—*Quintard.*

HISTORICAL INTRODUCTION.

The year 1866 is famous in the annals of epidemics, because of the wide-spread prevalence of Asiatic cholera in the United States. Whenever this dread disease sets out on a tour, commencing in its remote and obscure seats amid Hindoo hamlets, the people of Tennessee take a lively interest in its progress. For hitherto that progress has never terminated without notable halts in many localities in our beautiful State. So it was at the date mentioned above, that the Nashville Medical Society, then well representing the profession, sounded a warning note, and urged the City Government by timely sanitary measures to ward off the impending danger.

In the daily newspapers of June, 1866, we read that "Dr. C. K. Winston, President of the Nashville Medical Society, has suggested the names of the following physicians as a Board of Health for the various wards of the city, in view of the probable approach of the cholera." He also suggested that the first meeting be held at the office of Dr. T. L. Maddin, on next Tuesday evening, at 8 o'clock. Accordingly, on June 5th, 1866, the *first Board of Health of Nashville* was formed thus, the members not necessarily residing in the ward designated:

For the First Ward, W. A. Cheatham and J. R. Buist.
For the Second Ward, J. C. Newnan and H. M. Compton.
For the Third Ward, T. L. Maddin and W. L. Nichol.

For the Fourth Ward, J. W. Morton and W. B. Maney.
For the Fifth Ward, J. D. Winston and J. H. Callender.
For the Sixth Ward, T. B. Buchanan and J. D. Plunket.
For the Seventh Ward, E. F. P. Pool and J. H. Currey.
For the Eighth Ward, C. A. Brodie and J. A. Beauchamp.
For the Ninth Ward, T. M. Hughes and V. S. Lindsley.
For the Tenth Ward, T. A. Atchison and D. DuPre.

The Board was organized by electing J. C. Newnan, President; T. L. Maddin, Vice-President; and J. D. Plunket, Secretary. Full interchange of opinions took place, and much earnestness of purpose was exhibited.

Three other meetings were held in June. The Board was divided into Committees on Hygiene, Nuisances, Endemic Diseases, Epidemic Diseases, Meteorology and Mortuary reports. On the 18th, W. D. Horton takes the place of J. H. Currey. On the 26th, the result of conferences with the City Government is given in the shape of a bill to establish a Board of Health, which had passed and become a law. There was perfect co-operation.

In July and August the Board met five times, cholera approaching from Louisville. To August 11th, Secretary Plunket reports one case, a visitor from Cincinnati. To August 31st, seven deaths. By September 15th, the epidemic was fully under way.

By October 13th, the epidemic was a thing of the past. The *Dispatch* of that date estimates at over eight hundred deaths, the harvest which the pestilence gathered while it held high carnival in the city; and says, "With the single exception of Memphis, the mortality has been greater in Nashville, according to population, than any other city it has yet visited in this country." It also states that, "the pestilence raged with greater force than during its former visitations."

Under the smart of this terrible punishment for inattention to the warnings of medical science, the municipal authorities no longer hesitated to make the Board of Health a reality. On April 11, 1867, the ordinance of June 23, 1866, organizing the Board of Health was amended, so as to create a Health Officer, with a salary of $1,800 per annum. With the exception of five months, autumnal and winter, his entire time was to be devoted to his duties; while during all the year he was subject to the

instructions of the Board. The Health Officer was to be nominated by the Board of Health and elected by joint vote of both Boards of the City Council.

On April 15th, Joseph Jones, M. D., professor of physiology and pathology in the medical department of the University of Nashville, was nominated as Health Officer, and afterwards duly elected. He was the first person who filled that office in Nashville or in Tennessee. An expert scientist, and a physician who had filled a high position in the army of the Confederate States during the four years contest, he was thoroughly furnished for the difficult task to which he was summoned. He devoted his entire energies to the work, was cordially sustained by the Board, by the City Government, and by the citizens generally.

Nashville had in earnest entered upon a career of sanitary reform, which if continued a few years would have made the city as renowned for health as it has always been for intellect.

All this was frustrated by the strange political anomaly which disfranchised the wealth, intellect and virtue, while it enfranchised the vice, ignorance and misery of the city. From the minutes of the Board of Health it appears that on December 11th, Prof. Jones was unanimously and against his own protest nominated as Health Officer for the year 1868. The City Government ignored this nomination, and elected a candidate of their own. The Board of Health did not see proper to contest this illegal step, and virtually came to an end; although a futile attempt was made to revive it July, 1869, when John M. Bass, as Receiver, replaced the entire City Government. Against the respectful remonstrances of the Board, he made the fatal mistake of economizing at the expense of the public health.

In 1873, a year whose fame will long be connected with that of Asiatic cholera, Nashville received another severe and costly lesson on the importance of sanitary common sense. And on May 27, 1874, the ordinance creating the present Board of Health became a law. On June 1st, the Board met and organized, Dr. J. D. Plunket being President, and Dr. J. R. Buist, Secretary. The other members were, the Mayor T. A. Kercheval, Professor Charles K. Winston, M. D., and Henry M. Compton, M. D. Mayor Morton B. Howell became a member on Oct. 6, 1874. Dr. J. R. Buist resigned Feb. 20, 1875, and W. J.

McMurray was elected to fill the vacancy. He went out October, 1875, being elected alderman, and Dr. Buist was chosen to fill the vacancy. October, 1875, Thomas A. Kercheval again entered the Board as Mayor.

In May, 1876, Dr. John A. Draughon was elected Dr. Winston's successor. Dr. H. M. Compton, who died on July 20th, 1876, was succeeded by Dr. J. B. W. Nowlin. Dr. Buist's term expired June, 1877. He was unanimously re-elected.

On June 3, 1874, John Watson Morton, M.D. was chosen Health Officer. The Board at once entered upon its work with diligence. Proper blanks were prepared, and a Mortuary Register commenced on July 4th. Dr. Morton retired from office on June 10th, 1876, when the present incumbent took charge. The work accomplished by the Board during the past three years, is exhibited in the report of Dr. Morton, November 24th, 1875, and in the following pages.

The great object of the Board has been to lay a permanent foundation for durable future work. It has endeavored to carry the people with it, commencing its labors in the full tide of the greatest commercial revulsion America has ever known; it has been exceedingly cautious in urging expensive sanitary measures, and has contented itself with keeping before the citizens and the municipal authorities the unspeakable importance of cleanliness on all premises, private and public. It has also, in addition to reliable and valuable mortality statistics, collected a large amount of most important data, which will always be of use in the future.

The great questions of water supply, of drainage, of sewerage, of night and day scavengering, have been taken up, and in some cases very satisfactory progress made.

Having within the past year studied with care the reports of fifty or sixty city and State Boards of Health, I may perhaps be allowed to congratulate our own people upon the fact that the essential elements of permanence, medical skill, and freedom from the deadly poison of politics, all unite in the composition of the Nashville Board of Health.

Dr. Manning Simons, an eminent physician of Charleston, in an exhaustive and able report made to the South Carolina State Medical Society, in 1877, attributes the well known low

sanitary condition of the wealthy and intelligent city of Charleston, to the wretchedly defective organization of the Board of Health.

The Board of Health of Charleston has undergone many changes, and it is a question as to whether these changes have not been for the worse, and not for the better, on each occasion.

In July, 1815, we find an ordinance to preserve the health of the city of Charleston, and to appoint commissioners of health, seven of whom "shall constitute a quorum," to meet at least once a week, or oftener if they deem it necessary.

In January, 1842, the office of city registrar was created. His duty was prescribed as follows: "He shall prepare and publish weekly bills of mortality make and preserve the meteorological and thermometrical observations; keep a public register of all marriages, births and deaths, which take place within the city; inquire into the cause of all epidemic deseases, and report the same to the Mayor or the Board of Health."

December, 1858, the Board was again changed, so as to consist of the Mayor of the city, one alderman from each of the wards of the city, and the city registrar, and they were endowed with all the powers hitherto conferred by law upon the commissioners of health.

August 3rd, 1869, the Board was again changed, and on the suggestion of our friend, Dr. R. Lebby, Sr., the most reasonable and the best mode of formation of the Board was adopted.

On this plan, the Board was composed of the Mayor, the President of the Medical Society, the Dean of the Faculty of the Medical College of the State of South Carolina, the Physician of the Orphan House, the City Registrar, the Health Officer of the Port and Harbor of Charleston, and the Chairman of the Commissioners of the Alms House, Markets and Orphan House.

In 1872, the Board was again changed, so as to consist of the "Mayor, as chairman; the City Registrar, who shall also be secretary of the Board; and of the medical committee, two practicing physicians, who, with the Registrar, shall be the medical committee of the Board, to be appointed by the Mayor, subject to confirmation by council, and one citizen (not an alderman) from each ward."

This would have made a good Board of Health had it been possible for it to remain long in existence.

Again, in March, 1875, the Board underwent a change, by which "It shall consist of one physician, one pharmaceutical chemist, two citizens, and two aldermen, all of whom shall be appointed by the Mayor. The city Registrar shall be, ex-officio, a member of the Board."

This Board then has been provided with ample and excellent laws, and with power to enforce them, and yet we only express the feeling of the people, and even some of those who have been members of the Board, when we report that it has been a complete failure. Further, we have seen in our brief sketch of the history of the various phases of formation through which the Board has passed, that medical men, from time to time have been members of it, but one

by one these gentlemen have resigned their post, and scarcely a year passes that the physicians on the Board do not give place to others.

Your committee made inquiry into the causes of this, and found by the statement of one who has but recently resigned, that it was brought about by the fact, that whilst he was anxious to contribute in any way in his power, even at the sacrifice of time, and with the expense of labor, to the benefit of his fellow citizens, he found that it was useless to make recommendations for the improvement of the public health under the circumstances in which he found himself placed.

The committee feel justified in saying that if we are to judge of the efficiency of the Board of Health of the city of Charleston, by the results obtained through its existence, it has been an eminent failure since its organization.

We can say nothing more of its various changes than that its last stage is even worse than its former.

The pre-eminence of Great Britain among Nations, and of Massachusetts among States, in public hygiene, is owing to the construction of their Health Boards. In these, to medical science, the lead is uniformly given, and from these party politics are always banished. Boards otherwise constructed have, as in Charleston, always disappointed public expectations. St. Louis may be cited as a most instructive contrast to Charleston. See Report, 1876, p. 15:

It is worthy of note, that the era of great improvement dates from the formation of a Professional Board. In an age marked by a decided appreciation of specialties in professions, commercial occupations, and even in the insignificant variations of mechanical pursuits, it is strange intelligent persons should be found—men, too, who would not commit a favorite dog to unworthy hands, and who are yet willing to confide the momentous duties of conserving public health to persons whose training and habits of thought in no way specially qualify them for the important trust.

For sixteen years before the formation of this Board, notwithstanding an incomplete mortuary registration, by which to estimate, the death rate oscillated between 30 and 132 per 1,000. In two years thereafter it fell to 20.7, and has never been greater than 21.3, and in 1874 touched the almost incredibly low rate of 1.44 per cent., or 14.4 per thousand, an event that marks a new epoch in the history of sanitary science.

Fifteen per thousand has been hitherto regarded as the maximum of perfection for large cities, while eleven deaths in every thousand has been thought to be unavoidable. Examples, however, of rates as low as 8.4 and 9.7 in small cities are not wanting; but we have enjoyed a degree of excellence in public health not before attained by any city of equal size. The greatest security to which London aspires is 17 to 1,000.*

* AN ORDINANCE establishing and regulating a Board of Health in the City of Nashville.

Be it enacted by the Mayor and City Council of Nashville: SECTION 1. That a Board of Health is hereby established, which shall be styled the "Board of Health of the City

REGISTRATION OF DEATHS AND SANITARY PROGRESS.

In the "Eighth Report of the State Board of Health of Massachusetts," Dr. C. F. Folsom, Secretary, with entire truth, affirms that—pp 264–258,

It is not too much to say that modern sanitary science owes its existence to the registration of deaths and the localization thereby of insanitary conditions. It has been very much advanced, too, by the careful enumeration of cases of sickness as well as of deaths, whereby epidemics and locally prevalent diseases have furnished the means of scientific study, from which general laws have been learned, and through which state medicine has become a necessity of modern life.

In considering how to avert the recurrence of the terrible plagues which visited London in the sixteenth century, the first step was to find where and under what circumstances people died, and how variously different localities were affected. For this purpose registration was organized, imperfect, it is true, but sufficient to give many important hints. Much later, when the Poor-Law Board was created, a better system of registration was adopted; but it was only in 1837 that it was carried out with all the force of an Act of Parliament, and with the co-operation of the physicians, surgeons and apothecaries promised by the presidents of their associations. The law has been improved from time to time by many amendments; and finally physicians were compelled to return certificates of death under penalty, in 1874, as was then already the law in Scotland.

---

of Nashville," and shall consist of the Mayor and four physicians, who shall be elected as hereinafter provided.

SEC. 2. The physicians elected as members of the Board of Health shall be elected by the City Council, by ballot, in joint session, at the next regular meeting of the Board of Aldermen, after the passage of this Ordinance, or immediately thereafter, should the Mayor convene the City Council for that purpose. One of said physicians shall be elected for a term of four years, one for three years, one for two years, and one for one year, and annually thereafter; the vacancy occasioned by the expiration of the term of the short term member, shall be filled by the election of his successor, who shall be elected for a term of four years. Any vacancy occurring in said Board by death, resignation or removal, shall be filled by the City Council, by ballot, in joint session.

SEC. 3. Said Board of Health shall serve without compensation, except the physician of said Board, who may be elected Health Officer, and shall elect from their own body a President and Clerk or Secretary, and such other officers as they may desire, and may prescribe such rules and regulations for their government, and making effective the ends for which the Board was created, as they may deem proper. It shall be the duty of the Mayor to cause official notice of their election to be given to the several members of the Board, immediately after their election; and when said Board shall be first elected, and at each succeeding year thereafter, they shall at once organize, and on being organized, shall inform the City Council thereof. Should any one or more of the physicians of the Board, after being notified of his or their election, decline to serve, the City Council shall, as soon as possible, fill said vacancy, in the manner provided in section second. Said Board shall meet at least once in each month, and as much oftener as they may deem advisable to promote and secure the health of the city, and to prevent the introduction of contagious, malignant, dangerous or infectious diseases.

SEC. 4. There shall be elected by said Board a Health Officer, with a salary at the rate of not exceeding ($1,500) fifteen hundred dollars per annum, to be paid by the city in monthly installments, and said Health Officer may be elected from among the physicians who are members of the Board, if the Board should think proper; and the City

To such a high degree of perfection has registration of deaths now arrived in England, that on each Tuesday a printed pamphlet of ten pages is prepared and sent over the Kingdom, giving the causes of deaths, etc., with the conclusions and warnings to be drawn from them, *for the week ending the previous Saturday*, and collected from twenty-three towns, containing over 8,000,000 inhabitants. This return also contains the latest information from the large cities of the world, from New York and Philadelphia to Calcutta and Bombay, and fully justifies Dr. Farr's enthusiastic remark that "Thus observers, like watchmen on the walls, are ever on the lookout, so that they see exactly what is going on, and neither plague, cholera, nor any other great epidemic can take the nations by surprise." Quarterly, yearly and decennial reports are also published.

Henry Frazer Campbell, of Augusta, an eminent practitioner and writer, in First Georgia Report, 1875, p. 94, pays a graceful tribute to Massachusetts:

While glancing at the history of public sanitation, we cannot fail to note with gratifying pride, the very early period, comparatively, in which our own country began to give the most earnest attention to the all-important subject. We have before us the thirty-second registration report (for 1873) of the Commonwealth of Massachusetts, by which we are informed that her registration law went into effect as early as 1841, making her, as is well known, the first State in this Union who entered upon the enlightened and humane legislation on vital statistics so strongly tending to the advancement ot the health and to the protection of the lives of her people. This was thirteen years before the

---

Council shall be notified of the election of said Health Officer. The regular term of office of the Health Officer, shall be two years, and until his successor is elected, beginning at the first election, when the Board is first organized. Said Health Officer shall perform such duties as may be prescribed by the Board of Health, and that after this municipal year, he shall perform all the duties of the physician to the workhouse, and that from and after that time the office of physician to the workhouse be abolished. Said Health Officer may be removed by the Board for just and sufficient cause. The Board of Health shall, when they consider the public welfare requires the services of Sanitary Inspectors, recommend to the City Council for appointment, not exceeding four persons, for Sanitary Inspectors, and such of them as may be appointed by the City Council, shall be subject to removal at the pleasure of the City Council, and for their services they shall receive such monthly compensation, not exceeding $100 per month, as the City Council may prescribe by resolution. The duties of the Sanitary Inspectors shall be prescribed by the Board of Health.

SEC. 5. In consideration of the services to be rendered by the Board of Health, the Mayor is authorized to procure a suitable room in the city, and properly located, for holding its meetings, and to furnish the same in an appropriate manner; which room shall also be used as the office of the Health Officer; and the Mayor is also authorized to cause said office or room to be furnished with fuel, lights and stationery at the expense of the city.

SEC. 6. The Health Officer, or any member of the Board of Health, may enter upon or into, and examine any place; or, upon the written requisition of the Health Officer, or any member of the Board of Health, the City Marshal, Street Overseer, or any of the policemen, shall promptly enter into, and examine the condition of any building, cellar, lot, privy, or other place, supposed to be foul, damp, or otherwise prejudicial to health; and if anything there be found existing, permitted or done, contrary to ordinance or Sanitary Regulation, or prejudicial to health, or being or tending to become a nuisance, notification shall be given to the owner or occupant of the premises to remove or abate the same; and if he fail to do so, or if such owner or occupant be absent from the city,

introduction of such a law in Scotland, twenty-two years prior to that of Ireland, and only four years subsequently to that of England, which may be considered the earliest mover in this important measure of wise political economy.

The Nashville Board of Health has from its establishment recognized these principles. Beyond question its Mortuary Register is honestly kept. The law is stringent, and of such a character as to be readily enforced. No one can die within the city limits, and be buried, without due record. At the same time great care is taken to separate from the list parties interred in the city cemetery from without the limits. As the lessons derived from such statistics are increasingly valuable with the space of time over which they spread, an analysis of the Register for the year 1875, as well as that of 1876, is given in this report. No report was published last year. This publication should be kept up annually, even if it be without note or comment. The great practical value of mortality registration is demonstrated by Boston Report, 1876, p. 24:

The immense assistance which this mortality registration has afforded to the Board during the year, in its endeavors to promote the sanitary welfare of the

---

then, without such notice, upon the order of the Health Officer, or any member of the Board of Health, such nuisance, or anything tending to nuisance, shall be removed or abated, at the cost of the owner of the premises, to be recovered by suit at law.

SEC. 7. The Board of Health is fully empowered to establish and enforce the observance by inhabitants and visitors of the city, of such Sanitary Regulations as the Board may deem best calculated to guard against epidemics, infectious, contagious, or malignant diseases, and prevent or check their extension; but this shall not authorize the Board to establish quarantine laws. And the proper officers of the city are not only authorized, but are required to act promptly in enforcing a strict observance of the Sanitary Regulations, as permitted by this ordinance.

SEC. 8. On and after the publication of this ordinance, it shall be required that every undertaker or other person, before removing any corpse for burial, shall obtain a permit from the Health Officer to do so; and in order to obtain such permit, he shall present a certificate from the attending physician setting forth the name, age, nativity and residence of the deceased, and the nature of the disease or injury causing death. If there has been no physician in attendance, some responsible person cognizant of the facts in the case shall apply to the Health Officer, or any regular physician, and give such a statement as will enable him to fill out the certificate for the undertaker. In the event of failure on the part of any undertaker or other person to comply herewith, he shall be subject to a fine of $25 for each offense. If in any case the account given to the Health Officer or physician is of such a character as to leave any doubt in his mind as to whether the death was the result of natural causes, it shall be his duty to report the same to the Coroner for investigation. The Sextons of the different cemeteries shall not grant burial to any corpse unless the above provisions have been complied with, and in the event of an attempt being made to remove the body of any person who has died in the city, beyond the city limits, without the required permit, the police are authorized to detain the same, until they have satisfied themselves that no criminal circumstances have been connected with the death thereof. If at any time it is deemed advisable, the Board of Health, or Health Officer, may empower the Sanitary Inspectors, or any other competent person, to grant said permits.

city, can hardly be overestimated. Without delay or obstruction the direct return of deaths has placed the Board in a position to investigate, and in many instances to remove, conditions inimical to life and health. Preventable local causes of mortality have thus been repeatedly discovered, which else might have escaped detection, to work further mischief in homes already bereft. The desolating inroads of diphtheria, of scarlatina, of cholera infantum, and of other maladies included in the group of zymotic or filth diseases, have had in this manner immediate recognition, and, as far as lay in the power of the Board, energetic resistance Without entering even an indirect claim that the disease alluded to or any others are under the full control of sanitary authority, the Board feels confident that it has secured, in the registration of mortality, in the promptly reported information concerning the locality and causes of deaths, an immediately available and effective reinforcement in the prosecution of sanitary work.

REGISTRATION OF MARRIAGES AND BIRTHS.

The Board is not unmindful of the very great importance of this subject, both to social and political, as well as to sanitary science. It has not, however, seen any reason for undertaking it, under the present laws of Tennessee. There is no possibility

---

SEC. 9. The existence of unvaccinated persons (excepting such as have had small pox or varioloid), over one year of age, in the city of Nashville, is hereby prohibited, and the parents or guardians of such persons, if a minor, or the individual him or herself, if an adult, shall be subject to a fine of five dollars, upon presentation before the City Recorder, and an additional fine of five dollars for every ten days thereafter they delay in having the operation of vaccination performed. Provided, however, that if any person so proceeded against can show by the certificate of a respectable physician that the operation of vaccination has been performed upon said person, but without success, within the year preceding, or has been performed five times during life, or if character known to the Court to be good, shall state the same, the fine shall be remitted.

SEC. 10. The Board of Health shall decide as to what constitutes a nuisance, or thing prejudicial to the health of the community, and may authorize their Health Officer, or other competent person, to serve notice upon the owner or occupant of the property on which the said nuisance exists, for its removal or abatement, and to specify a reasonable time within which it shall be done. And in the event of a failure on the part of said owner or occupant to comply with the requirements of such notice, within the time given, he shall be liable to a fine of not less than five nor more than fifty dollars; and said nuisance shall be abated at his, her or their cost, to be recovered by suit at law.

SEC. 11. It is hereby made the duty of the teachers in the public schools to require, as a condition for admission of each and every child, a certificate of its vaccination, signed by a physician, or other satisfactory evidence.

SEC, 12. That it shall be the duty of all physicians to report to the Health Officer, immediately, the existence of any case of contagious disease coming within his knowledge. A failure to comply with this section shall subject the party so in default to a fine of not less than five nor more than fifty dollars.

SEC. 13. All persons are required to comply with the provisions of this Ordinance, and with the precepts, regulations and requirements of the Board of Health, or Health Officer, given or made as permitted by this Ordinance; and whoever shall fail, neglect, or refuse so to do, shall be fined not less than five nor more than fifty dollars.

Approved May 27th, 1874.

THOMAS A. KERCHEVAL, Mayor.

of collecting accurate returns. The medical profession, and other liberally educated men in Tennessee, should make a strong and combined effort to secure an efficient law upon this subject from the General Assembly of 1879. It is high time that the semi-barbarism hitherto prevailing in our code, upon the subject of vital statistics, should be wiped out.

My attention has been directed by a physician, who has given this subject much thought, to the imperfections of the Tennessee Code in regard to the important office of Coroner. He is a mere appendage to the Sheriff, though elected by the County Court. Being a kind of deputy or substitute Sheriff, a member of the medical profession is never chosen, though the duties of Coroner proper are purely medical. In Davidson County, in 1876, 43 inquests were held; 36 males and 7 females; 32 white and 11 colored. With increase of population, the duties of this officer will become very important. The matter should be brought before the General Assembly of 1879, in connection with that of registration. In each County the Coroner should be a physician, and should also act as County Registrar for births, deaths and marriages. Upon this plan vital statistics may be collected, in a scientific manner, by competent men and at moderate cost.

The value of such information is forcibly expressed by Dr. Thomas C. Minor, of Cincinnati, see Scarlatina Statistics, p. 3.

In therapeutics, every new remedy must have been used in a certain number of cases before its absolute properties can be determined. In pathology, the lesion most characteristic of any form of disease must be demonstrated in the dead-room in a certain number of cases, before it becomes an accepted truth to the pathologist. In physiology, all experiments must be repeated in a number of cases, before they can be regarded as of any definite value. In surgery, it is a notorious fact that the most commonly performed operations are those which show the lowest percentage of mortality; the difference of pulse rate and respiration in infancy and old age, and in the different sexes; the age of puberty and primary ovulation, as modified by race and climate; the influence of climate on fecundity; the fact that early marriage produces sterility and short-lived children; that libertinage begets sterility; that free institutions and virtuous habits beget fecundity; that natural causes, such as sex, age, season, hour of the day, etc., react on mankind. Thus we see that the majority of births occur at night; of deaths, in the early part of the day; that the death rate at different ages varies; that some occupations and professions are more healthy than others; that climate influences physical development; that climate influences some diseases: thus we know that at certain latitudes and altitudes, intermittent and yellow fever never occur; that cholera is never seen

in Iceland, Siberia, Greenland, or Australia? that phthisis is never seen in Iceland, and only rarely in Norway, Madras, or the elevated plains or pampas of Mexico. These, and innumerable other important facts, are based almost solely on the study of statistics.

THE DEATH RATE OF NASHVILLE.

In examining the mortuary tables found at the close of this report, the first point that arrests our attention is the intrinsically and relatively high death rate of the city. This subject has excited much comment both at home and abroad; and connected with our history in cholera epidemics has given us a very unenviable reputation. Why a site, from which originated the settlement of this portion of the State, and which, within the memory of many citizens, was a summer health resort of multitudes from the more Southern States, should have thus descended in the sanitary scale is a mystery to many. The fact admits of ready explanation. It is a two-fold legacy. First, from a general cause, active and noticed in a thousand other cases, Nashville has grown from a village to a town, from a town to a city, without changing its habits; hence, it has necessarily fallen into a condition grossly at variance with the first principles of medical science and common sense. First settled April 24th, 1780, it has, until within three years, had no effective sanitary code. The moment a community passes from the rural to the village condition, sanitary law is imperatively needed. This point need not be elaborated. The data and conclusions are obvious to any well informed mind. All villages, towns and cities in the United States are to-day suffering immense loss from similar neglect.* The second cause is special, and a legacy from the late civil war, and consequent social revolutions.

*The student of municipal law has in the annals of epidemics in Nashville, a marked example of a great defect in American, and perhaps foreign jurisprudence. As a scientific truth, nothing is more self-evident than that a city, town or village is a natural unit. It is an entity, growing, or if you please, evoluting by natural laws just as much as an individual. It cannot be cut up arbitrarily by ficticious lines without gross damage. Whenever a household or building becomes in close proximity to a city, it becomes at once an integral portion of that city. Without the necessity of any special legislation, it should, by virtue of a general law, be incorporated. Municipal lines should all be elastic and self-extending- Upon our artificial, uncientific system, not unfrequently large country districts are embraced within the lines, while well-built streets are excluded, For when new towns are laid out no one can see ahead and tell

The very small city of Nashville, with an area of 1824 acres, contains 27,085 (1877) inhabitants. These are mainly crowded upon two thirds of this area. Of this number, 9582 are of African descent, colored, as technically styled in our tables. These, again, reside mainly in old stables, situated upon alleys in the midst of privy vaults, or in wooden shanties a remnant of war times, or in huts closely crowded together in the outskirts. Bad as the surroundings are, they become intensified tenfold by the smallness of the rooms, want of ventilation, and by the vice, ignorance and squalor of the occupants. Here, as in so many other questions for study, the fact compels notice, that unlike all other American cities, which extend their corporate lines far outside the range of contiguous buildings into the country, Nashville is an artificially limited corporation, with a city all around it. Consequently all the defects which should be credited to a large population and area, are charged to one of very limited extent. This is notably the case as it concerns the colored element. A very cursory examination of the mortuary tables will make this clear.

AFRICAN MORTALITY.

By the census of 1875, which is used in making our calculations when not otherwise specified, the total population of Nashville was 27,000; of which white, 17,100; colored, 9,900. In 1875, total deaths 933; white, 441; colored, 492: death rate total, 34.55; white, 25.78; colored, 49.69. In 1876, total deaths 899; white, 450; colored, 449: death rate total, 33.25; white, 26.31; colored, 45.35.

The above facts, so pregnant with thought, are quite in keeping with the statistics from other cities. They bear with great force upon one of the most prominent questions of the day.

---

where the expansion will sonest take place. This is a wide theme. In our case, a very large portion of Nashville *de facto*, is outside of Nashville *de jure*. It is precisely here that epidemics do their worst work. It is here that the disease broods, breaks out and rages, until at last all Davidson County suffers untold damage; and the city proper reaps financial heavy loss, and suffers much in reputation. If our people desire real sanitary reform, and a splendid inland city of a hundred or more thousand people, which we ought to have had long ago, this subject must be agita'ed. We must get rid of our three antagonizing powers, and have one grand municipality, extending at least three miles in every direction from the Maxwell House. Simply as a sanitary measure, this is of prime necessity.

Certainly the African race, whose splendid labor has, both before and since the days of revolutionary strife, done so much for the United States, and whose excellent temper was so admirably displayed in days of bloodshed and devastation, deserve better of the American people than to be allowed to perish in the stables and hovels of cities.

In Memphis, for 1876, the total death rate was 25 per 1000 per annum; white, 18.06; colored, 40.06. Population, total 50,000; white, 35,000; colored, 15,000.

The Chatanooga Times, of Aug. 5, 1877, contains a very instructive Mortuary Report, by J. H. Vandeman, Registrar, in which Dr. Jas. B. Norris has carefully tabulated the records of five years. Present estimated population, 12,000: white, 7,500 colored, 4,500.

DEATH PER 1,000 FOR THE DIFFERENT YEARS.

	W.	C.	TOTAL.
For the year ending July 31, 1873,	22.1	56.0	34.8
For the year ending July 31, 1874,	21.0	41.3	28.6
For the year ending July 31, 1875,	17.8	31.8	23.0
For the year ending July 31, 1876,	20.1	30.0	23.9
For the year ending July 31, 1877,	18.6	29.5	22.5
For the five years,	19.9	37.0	26.6

Knoxville, in 1876, had a total population of 13,000:—white, 8,000; colored, 5,000. Death rate, total 23.00: white, 18.00; colored, 31.20.

Richmond Report, 1876, p. 6, says: "We estimate that the population of this city at the middle of the past year was 75,000: white, 42,830; colored, 32,170. The death rate per 1,000 of the entire population was 21.98; of the white it was 17.36, and of the colored, 28.13."

The mortuary statistics of the District of Columbia, in charge of Dr. D. W. Bliss, Registrar, from the accuracy and minuteness with which they are kept and worked out, will prove a perfect mine of wealth to the medical philosopher, if continued through a generation or two. Population, 160,000: white, 115,000; colored, 45,000. Death rate for year ending September 30, 1875: total, 27.20; white, 19.22; colored, 47.60.

The total number of deaths registered for the twelve months ending Sept. 30, 1876, was 4,246, being 2.654 per cent. of the total population, or 26.537 per 1,000.

Of this number, 2,153 were white, being 1.872 per cent. of the white population, and 50.706 per cent. of the total mortality, and 2,093 were colored, being 4.651 per cent. of the colored population, and 49.294 per cent. of the total mortality. —D. C. Report, 1876, p. 26.

Baltimore, 1875. Total population, 350,000; white, 305,000; colored, 45,000. Death rate—total, 21.67; white, 19.80; colored, 34.42. (See D. C. Report for 1875, p. 195.)

Mobile Report for 1875, p. 23, gives estimated population as 40,000: white, 28,000; colored, 12,000. Total number of deaths, 619: white, 341; colored, 278. Percentage of deaths to population, 1.54¾: white, 1.21½; colored, 2.31¾.

Selma Report for 1876, p. 3, gives population, 8,000; white, 3,500; colored, 4,500. Death rate, total, 16.87; white, 14.28; colored, 18.88. The low comparative colored death rate does Selma great credit.

New Orleans, for 1875. (See Louisiana State Board Report, p. 63.) Estimated population, 210,000: white, 155,000; colored, 55,000. Mortality per 1,000 of population, 29.13; mortality of white persons per 1,000 white population, 25.45; mortality of colored persons per 1,000 colored population, 39.69.

Dr. Robert Lebby, whose labors as City Registrar of Charleston are so highly appreciated by the Medical Profession, in his Report for 1876, p. 33, gives an interesting table, showing the same results as elsewhere:

	1876.			1875.			1874.			1873.		
	Population	Number of Deaths.	Proportion of Deaths.	Population	Number of Deaths.	Proportion of Deaths.	Population	Number of Deaths.	Proportion of Deaths.	Population	Number of Deaths.	Proportion of Deaths.
Whites.....	24.528	668	1 in 36.71	24,528	624	1 in 39.30	24,000	718	1 in 33.43	22,145	507	1 in 43 58
Blacks and Colored	32.012	1,343	1 in 23.83	32,012	1,240	1 in 25.84	26,000	1,230	1 in 21.14	26.811	1.009	1 in 26 63
	56 540	2,012	1 in 28.10	56,540	1.864	1 in 30.33	50,000	1,948	1 in 25.66	48.956	1.516	1 in 32.29

In view of the above warning data, it is but simple duty to call marked notice to a custom which prevails in Nashville, and doubtless in the above named cities, and which is highly deleterious to both the health and morals—namely, that of holding

meetings at the Churches nearly through the entire night. Physicians express but one opinion on this point. The many able, cultivated and devout teachers, true philanthropists, and practical christians of the highest type, who have devoted time and energies to elevating the African race, endeavor to put an end to it, as utterly at variance with the Apostolic ordinance, "Let all things be done decently and in order."

THE DEATH RATE WARNS.

Whatever the causes, and though readily explained of the above facts, the lesson taught remains the same—to the right about face. Says an intelligent British author:

> One of the first great objects of sanitary organization, is to watch the death-rate; to watch it, not only over a city or parish, but in detail; to watch it with regard to difference of sex, age, and circumstances; to watch it from month to month, and even from week to week; to watch it as affected by different diseases and particularly what are termed epidemic diseases, and such diseases as we believe to be, in a great degree, preventable; and this done, to make known the results from time to time to those who are chiefly concerned in sanitary evils, so as to effectually bring home to the dwellers in darkness, ignorance, and disease, the immense significance of the facts taught by these figures.

The death rate warns. All wise people heed its warning. The municipal authorities of Nashville have at length been aroused to the evils resulting from the gross and culpable neglect of their predecessors, and are determined to wipe away the reproach now resting upon their domain.

Other cities have gone through similar unhappy lessons, have taken heed, and are making rapid progress in sanitary reform, and in improved health. Boston, by reason of increasing foreign population, tenement houses, and filthily made new land, began a few years since to decline in public health and to advance in the death rate. Instantly faithful guardians speak out, and great improvements result. In 1872, the late Dr. George Derby, (a name honored wherever sanitary science is cultivated,) in 4th Massachusetts Report, says:

> It will be seen that the mortality of Boston is unprecedented. Exclusive of deaths from small-pox, the mortality of 1872 exceeds that of 1871 twenty-five per cent. Including small-pox the increase is thirty-seven per cent. Such results seem fully to justify all which has been said in previous reports of our Board concerning the culpable neglect of public health by the city authorities of Boston.

Public opinion has at last been thoroughly aroused, and has compelled the aldermen to relinquish a large share of the power which they could not wisely exercise, and has placed it in the hands of an independent Board, from whom we have reason to expect the most salutary reforms.

In 1874, Dr. W. E. Boardman, 6th Massachusetts Report, warns a great State:

To recapitulate the facts which have been adduced to illustrate the statement that there is opportunity for improvement in the sanitary condition of our State, it is found that the mortality-rate is higher than that of any other State in the Union, excepting Arizona and Louisiana; that it presents an unfavorable comparison with many of the larger cities of the country, with London or Paris; that the death-rate is increasing gradually; and that, in 1872, while there was an unusual increase in the rate of mortality from all diseases, the affections included under the head of zymotic diseases occasioned a notably large number of deaths.

Both City and State applaud these faithful public servants, and act upon their suggestions.

Many people, from ignorance, associate dismal ideas with the very term death-rate, when in truth it is at the basis of the widest reaching, and by far the most benevolent of all modern scientific improvements. It is thus keenly studied that it may be diminished. When the life saved, the misery prevented, and the public wealth increased, by even a small diminution of the death-rate, are elaborated in all proper details and ramifications, no language descriptive of results will appear exaggerated; and the claim that State Medicine, the child of the present generation, the resultant of science, christianity, and good government, is chiefest among he triumphs of the Nineteenth Century, will not appear unfounded.

The death-rate may and has been wonderfully diminished. Look at Great Britain, the acknowledged leader in all sanitary reforms:

We are now able, through the registration reports, to mark with perfect accuracy the improvement in the duration of life throughout Great Britain. As improved works of sewerage and water supply go into operation in certain districts, the death-rate falls. As the foul alleys of Liverpool are cleared up, and the poor who had lived in cellars are brought to the light of day, the death-rate falls. And so it is everywhere. The improvement of public health, as expressed by that unerring guide, the death-rate, corresponds with all the means by which air and water are kept free from pollution. *Dr. George Derby*, (1st Mass., p. 45,) 1869.

On this subject a gross error prevails, met with in Nashville constantly. It is forcibly corrected by an expert:

It is a very common belief that an increased *rate* of mortality is the necessary result of an increase in the density of population. That this *is* a very general result cannot be denied; but that it is a *necessary* one, we think, admits of question—a point which may well be illustrated by reference to the sanitary condition of London, as indicated by the rate of mortality which was computed for a long series of years by Dr. Greenhow. He states that, during the decennial period, 1681 to 1690, the population of that city was about 530,000, while the death-rate, on the average, was about 42 in a thousand.

During the period, 1746 to 1755, with a population of 653,000, the mortality was 35 in a thousand. From 1846 to 1855, the number of inhabitants had increased to 2,362,236, yet the dath-rate was reduced to 25 per thousand, notwithstanding the fact that during this period occurred the cholera epidemics of 1848-49 and 1854-55. Since 1856, the population has increased to 3,311,298, estimated to the middle of 1872, while the death-rate has shown a gradual reduction, until, for that year, it was only 21.4 per thousand.

This same point is confirmed by the experience of other parts of England, where, during the past twenty-five years, constant efforts have been made to reduce the mortality by means of improvements in the sanitary condition of the people, and principally in the way of improving the facilities for water-supply and drainage. The beneficial effects of these endeavors have been proved statistically in the reports of the medical officer of the privy council, wherein it is shown that, in twenty-four cities and towns, with a population varying between 160,000 and 4,000, the average death-rate was reduced from 24.7 per thousand to 21.9, after the introduction of improved sanitary works, chiefly in the way of furnishing good water-supplies and efficient drainge. W. E. Boardman, M. D., (6th Mass., p. 70) 1874.

A volume, which indeed would be the history of sanitary reform in Europe and America, could be filled with similar conclusive facts. In Liverpool, before the city was purified, and people compelled to live above ground, the annual death-rate was 38 in one thousand; after these measures, 24 in one thousand. In Glasgow whole acres have recently been purchased by the municipality in the heart of the city, the houses destroyed and rebuilt, with the happiest results. The great and beautiful city of Paris has, for a quarter century, executed such improvements at enormous cost. The German cities profiting by these examples are entering upon the same career. The vilest and most noisome districts in New York have been greatly improved by the determined and vigorous measures of the Board of Health, which is wisely clothed with great power. Philadelphia and Cleveland may be mentioned as models for comfort, cleanliness, and beauty;

and yet their medical scientists are earnestly working for improvements. Louisville has for many years been quoted as an example of wisdom because of great public works bearing upon health. St. Louis, sorely afflicted by Asiatic cholera in 1866, and in previous epidemics, and ranking among the sickly cities, about ten years since established the present Board of Health. The results are marvellous. The records show it to be the healthiest great city in the world.

No fact in the whole range of science is better settled than that a high death-rate may be very much diminished by proper sanitary measures.

DIMINUTION OF DEATH-RATE.

Cicero says that under no circumstances does man appear so god-like as when he gives health to the sick. And this saying of the great statesman, orator, scholar, and philosopher, is justly celebrated as a noble and merited tribute to medical science and skill. How much does it expand in force and significance when viewed through the light of the achievements of modern State Medicine which restores health to stricken communities, and adds length of days to entire nations. Such great results require adequate means. The most universal, costly and effectual of these are the removal of filth, the supply of water, and the prevention of dampness. Many auxiliary and subsidiary measures combine in producing the grand result, but these are the essential bases.

THE REMOVAL OF FILTH—FILTH AND DISEASE.

The first steps in the way of health reforms took place under the stimulating scourge of severe epidemics. It was soon found that dirt, accumulated through successive generations, had an intimate relation with the virulence of epidemics. The great fire in London, 1666, following close after the plague of 1665, which cleaned out old London very effectually, and put a stop to further lodgments of the oriental pest, was a demonstration on an extended scale, still fertile in good results. In 1832 and 1833, the facts brought out in Great Britain by researches into the ravages of Asiatic cholera led to the same conclusions. Now, after fifty years experimenting on a vast scale, it is found that the presence of filth has very much to do with the prevalence and

existence of many diseases which daily occur, and add far more to human suffering and mortality than do even the worst epidemics. It is logical, therefore, that this subject takes up so much space in sanitary science, and is so constantly forced upon public attention. For thirty years it has been a leading topic in British legislation.

Dr. C. J. B. Williams, a pathologist of highest authority, says:

The soil which drains from habitations contains, in addition to excrement, dirty water, the washings and remnants of animal and vegetable matter used as food, and other offal. All these are mixed together, and stagnant in the corrupting slough that is retained in cesspools and privies, or that is carried into sewers. Every ill-drained house has a Pandora's box, ready to pour forth its evils when occasion offers, and always oozing them out in degrees sufficient for the impairment of health. These materials continually poison both air and water, and typhoid fever, diarrhea, cholera, dysentery, dyspepsia, inappetency, general weakness and mal-nutrition, are the results of their pestiferous operation acting in different degrees.

Dr. F. Winsor, 7 Mass., p. 206, 1876, testifies that

There has been a very marked growth of the scientific spirit of accuracy among physicians which renders them more and more on their guard about speaking positively in relation to the causation of stated cases of disease which have not been specially investigated. But never was there a time when physicians were so assured that many classes of disease can be prevented by right living, and foremost among the preventable diseases they class those connected with filth.

And Dr. E. McClellan, 2d Georgia, p. 175, 1876, sums up the matter tersely thus:

The neglect of sanitary laws, by any nation or any community, is punished by disease. What are these sanitary laws? They may be comprehended in but a single word—cleanliness. Cleanliness is everything: cleanliness of the individual person, of families, of communities. Cleanliness of clothing, furniture, rooms, houses and of their surroundings; cleanliness of food, water, and air; cleanliness of privies, cesspools and refuse-pits; cleanliness of streets, lanes and alleys; cleanliness of gutters, drains and sewers; cleanliness in the segregation of the diseased.

In this connection it is interesting to note the earliest statute on record, that of Moses (Deut. iii. 12, 13), in which he practically anticipated the profoundest teachings of chemical and physical science as to the best method of maintaining pure habitations. It is also suggestive that the persistent violation of this ordinance by an ancient people of high learning and civilization has led, in

all probability, to the origin, and without doubt, to the localization and permanent propagation of Asiatic cholera.

The customs of the Hindoos are very peculiar in some respects. It is calculated that one hundred and fifty millions of them always defecate on the ground; they have no privies or latrines, and even the native soldiers under British rule will not use them. A mutiny greater than that of 1857 might be produced if this necessary hygienic rule were rigidly enforced. Many thousands of tons of human excrement have thus been daily deposited upon the open ground for some thousands of years. Outside of the large cities of India, the bulk of the people always dwell in villages of from two thousand to ten thousand inhabitants, and from five to less than twenty miles apart. The result has been the accumulation of enormous amounts of faecal matter, with a corresponding degree of saturation of the soil, and the consequent extensive pollution of water in every direction. The disinfection of India can only be a remote possibility, and Europe must make up its mind to be scourged by cholera from that prolific source for many years to come, unless she protects herself by quarantine and disinfection. See U. S. Report on "The Cholera Epidemic of 1873," p. 685.

So great a hold has this subject taken of the medical profession, as to lead to the conclusion that the whole class recently termed Zymotic diseases, have an intimate relation with filth, if not as originating cause, at all events as an independent factor. There may be at first glance much difference between the schools of Liebig, Virchow, and the English pathologists, and that of Pasteur, Pettenkofer and Liebermeister, when the keen arguments *pro* and *con* of the germ theory are canvassed. Practically there is none. The physician called to a case of any of these diseases at once inquires about filth.

The principal Zymotic diseases are smallpox, measles, scarlatina, diptheria, whooping-cough, typhoid and typhus fevers, cholera, cholera infantum and diarrhœal maladies.

To show how this field is wrought out, the occurrence of diphtheria in Cleveland may be cited. In 1876 this disease caused 408 deaths out of a total of 3,227, in a population of 162,000. In consequence of this epidemic the government of that rapidly growing city have just published, in handsome typography, a report on "Filth in its Relation to Disease," by Frank Wells, M. D., Health Officer. It occupies 239 pages, octavo, and is a model monograph.

Nashville, in 1875, lost by diphtheria 100 out of a total of 933 deaths in a population of 27,000. And again, in 1876, 98 out of a total of 899. As compared with the Cleveland epidemic,

these are the figures for 1876: Death rate of Cleveland from diphtheria, 2.51 per thousand per annum, that of Nashville 3.62. In 1875 it was slightly higher. The diphtheria epidemic of 1876 has given sanitary reform a new impetus in the comparatively healthy city of Cleveland. We have suffered a more virulent epidemic of that scourge in two successive years. Yet some few men in our city still oppose the efforts of the Board of Health to prevent disease.

As furnishing useful matter for reflection to our own people, the closing paragraph of this report is here given:

In presenting this report to you, it has been far from my intention to overdraw the picture of the exisrence of what is known as filth, or of its relation to disease; but actuated by an earnest desire to improve the sanitary condition of our city, and thereby lessen its death rate, I have desired to call your careful attention to the undoubted fact that filth does exist, even in its most glaring forms, much more frequently than our ancestors, or perhaps even we ourselves have imagined, and that in this, the nineteenth century, neither individuals nor communities can afford to ignore the fact that they are in a great degree responsible for their own health. Just in proportion as this fact is lost sight of, just as surely will disease continue to prevail to the detriment not only of our own health, but of that of our descendents, to whom we are morally responsible for our neglect of sanitary precautions. Communities are easily aroused to the realization of their danger at the time of such a severe epidemic as has recently visited our city: but, like the horrors of an Ashtabula or New Hamburg disaster, the lessons to be learned from such an outbreak are soon forgotten. If this should occur at the present time, if we should consign to the dim memories of the past all recollection of our ability to stamp out certain diseases, we must be held accountable. Is it not better, therefore, to heed the "hand-writing on the wall," and by sanitary reform to prevent, as far as lies in our power, the possibility of another epidemic?

REMOVAL OF FILTH—HUMAN EXCRETA.

As late as 1862, Tardieu, one of the most weighty authorities on all questions of State Medicine in Europe, discussing the inconveniences and hateful nuisances to which Paris was subjected, because of defects in this prime necessity of health and decency, warmly advocates the introduction of the English system of water carriage. Since that date water closets have become general in Paris. And now a loud outcry is raised by the inhabitants dwelling upon the Seine and below the city because their beautiful river is poisoned. The difficulties surrounding this case are now taxing to the utmost the highest scientific and engi-

neering skill of France. This, which is but one from a multitude of similar cases, forcibly proves that the speedy, thorough and complete removal of fœcal matter from proximity to human dwellings, though universally admitted to be an axiom, is yet practically a *quæstio vexata.*

Accordingly we find a great mass of literature upon the subject. Keen disputes have been and still are waged as to the comparative merits of water closets, earth closets, and various systems of buckets, pits, and so on. As far as Nashville is concerned, this unsettled condition of the question need give no trouble. The sewerage of the city is so incomplete that water closets must be confined to the densely built central blocks, and will probably be no occasion of offence to the riparian dwellers upon the lower Cumberland for generations to come. Earth closets, properly managed, require such care and labor as to be used but by few. Though it is probable that as people become better informed on this vital but neglected subject, their use will become much more general. What Nashville is called upon to choose between is the present generally prevalent plan of boxes above the surface, and of deep, well-like pits; or of pits properly constructed of brick and cement, so as to be absolutely water-tight. This is a question of vital importance. No one familiar with the air in the alleys and back-yards during warm weather will for a moment hesitate in assigning as a main cause of our high death-rate the foul contaminations all the time arising from the multitudinous boxes and deep pits everywhere present. The magnitude of this evil will be apparent by referring to the statistics given in the tables compiled from the books of the Sanitary Inspectors.

The received views of medical men as to the effect of decomposing human excreta in causing disease are well known:

> One of the accepted modern names for this disease (typhoid fever) is pythogenic fever, or fever born of putridity—this being its distinctly proved external cause. That an obscure internal cause, which, in our real ignorance of its nature, is called a proneness or disposition to receive the poison, is necessary for its development, does not affect the truth of the fact, that without filth the disease is not born. The evidence connecting this disease and all its kindred with uncleanness and putridity, decomposing matter, and particularly the excrement of the bodies of men and animals, conveyed to the human system by air and by water, is given in great detail in the English government reports of the past

fifteen years, and cannot fail to convince any one who will examine them without prejudice. The whole train of so-called zymotic diseases, or diseases whose course suggested the idea of a morbid ferment, are of the same class.—*Dr. Geo. Derby*, (1*st Mass.*, p. 44,) 1869.

The city government should not hesitate a moment. An ordinance should prohibit all surface privies and boxes, and allow only water closets, earth closets and pits, all and each to be constructed, cleansed and disinfected, as required by the Board of Health.

Under such an ordinance the great majority of houses would be provided with pits. Two improvements have made these much less objectionable than formerly. First, the water-tight mode of building them, by which the surrounding soil is saved from pollution. Secondly, the introduction of odorless emptying machines instead of the old bucket system of cleaning, which justly was deemed a hideous nuisance. These machines have been but recently introduced—first in 1873 in Baltimore. Their use has rapidly extended. The latest reports of different Boards of Health, State and city, uniformly testify in their favor. As the objections to water closets are daily becoming better known, and as the earth closet system has failed to gain the public favor, which at first it bade fair to do, it is very probable that this new device may yet solve the question of the removal of human excreta to the satisfaction of both sanitarians and agriculturists. Under *rigid law* and *vigilant inspection* the service can be rendered frequent enough and clean enough to answer the requirements of the former, and restore to the soil a fertilizer much demanded by the latter. At the same time the dark, dangerous, and sadly-perplexing question of river pollution will be avoided. Situated as Nashville is, nothing can be lost, and very much will be gained by adopting the method which in Baltimore, Washington, and other cities, has met with great favor. It involves no heavy expenditures, and thus suits the present financial condition of city and people.

As this important practical question is now exciting much attention, the reader is requested to observe how steadily the plan endorsed above has worked its way into use, after full and patient investigation by the most experienced Boards of Health. The Philadelphia Report, pp. 55, 56, 1874, speaks thus advising *its* adoption:

The fact that Baltimore, New Orleans, Brooklyn, New York, Savannah, Wilmington (Delaware), and other cities have adopted the system, after proper investigation, indicates that its advantages are real and its value undoubted.

Its advantages are manifold. The work can be performed in the day-time; it is a cleanly and odorless method from beginning to end; and it is economical and practicable. We therefore desire to recommend it as a sanitary measure that possesses manifest advantages over the old system, and hope that it may have accorded to it a fair trial in our own city.

The merits of this improved method are too well known by this time to require extended remarks and explanations. The great point is to secure its introduction and the absolute abolishment of the present intolerable plan by the bucket and cart. A company has heen formed, and licensed with the privilege of working in the day-time, and is now in full operation. This effort should receive the most cordial support of citizens.

In Philadelphia Report, 1875, p. 4, the result is given:

On the 21st of July, the Board adopted a resolution which virtually abolishes the old bucket-and-cart system for emptying wells after the end of the year for which licenses have been granted, namely, April 15, 1876, and substituting therefor the odorless method, by means of air-tight apparatus, pumps and hose. This is a most important reform, which will put an end to a disgusting nuisance, and relieve the city of an opprobrium which has tarnished its reputation.

The Baltimore Report, 1873, p. 15, says:

The late City Council have distinguished their administration by the passage of an ordinance permitting the use of the "oderless excavating apparatus" for emptying privies in the day-time. This is the inauguration of a new era, and destined to prove one of the greatest blessings of the age. As stated in a communication on this subject to the late City Council, your Commissioner holds that a large proportion of the cases of cholera infantum occurring in all large cities during the heated term, are to be ascribed to the ancient and vile mode of doing this work, as well as to its transportation through the streets of the city, poisoning the air which is wafted into every open window.

In that of 1875, on p. 9, we find as follows:

The Board of Health has reason to congratulate the citizens of Baltimore, as I am sure they congratulate themselves, upon the accomplishment of a part, at least, of the great work of reform and improvement undertaken by the Board more than two years ago, namely, the suppression during the months of June, July, August and September of the night-cart nuisance, and the certainty that the period of its total extinction is not far distant. In the beginning of this contest the Board of Health found itself arrayed against a large and powerful class, backed by influential politicians, and it became necessary, when the responsibility of the act was thrown by the City Council upon the Board, that some one should assume the burthen of so radical a change. This your Commissioner did not hesitate to do, by refusing permits to all but the odorless companies during the months of June, July, August and September, and in spite of the storm of abuse hurled against him, held firmly to the purpose he had resolved upon.

Great has been his satisfaction, therefore, in seeing one after another of the most influential and well-to-do night-men coming into the odorless system, until at the present time thirty odd of the most violent of the adherents to the old system are now petitioning the City Council to pass an ordinance abolishing the night-cart system, and actually thanking the Board of Health for having brought about this revolution.

And again, in 1876, p. 12, it thus confirms the foregoing:

The troublesome question of how to control the night-men in the performance of their essential work, is now happily settled, and the distant thunder of the horrible night-cart is no longer heard, but has become a thing of the past.

The Cleveland Report, 1875, p. 16, dwells upon the defects of the bucket system:

The removal which is done at night is annoying to the surrounding neighborhood, especially in the summer months, when people are forced by warm weather to keep their windows open, and is also dangerous on account of the noxious gases entering houses through this and other channels. Night soil is removed nearly every night in the year, and as there are other means to remove this material without annoyance or danger to health, they should be adopted at once, especially as such removal would entail no additional expense, and would be no additional burden to the contractor.

This work may be accomplished by a pump so constructed as to raise and force, by direct action and without obstruction to its working parts, the contents of privy vaults, cesspools and sinks, and to cause their discharge, without exposure, into an air-tight tank.

Dr. Frank Wells, Health Officer of Cleveland, in prompt answer to inquiry, says, August 9, 1877:

Our vaults are now pumped out by means of an odorless excavating apparatus, as prescribed by our ordinances.

Dr. Heber Jones, secretary of the Memphis Board of Health, politely answering various queries, says:

We use the odorless excavating apparatus for emptying vaults, etc. We regard it the best means ever used for the purpose; in fact, it leaves little to be desired as far as neatness, dispatch, and absence of odors are concerned.

The Board of Health has this day, August 10, received from Dr. Ch. Rauschenberg a copy of the "Proceedings and Reports of the Sanitary Commission of the City of Atlanta, Ga., 1876." Published 1877. Octavo, 196 pages, with topographical map. This Commission was created by the City Council "for advisory purposes, to take under consideration the question of drainage and the disposal of the refuse (especially the excretion) of the city. Said Commission shall make the most thorough investiga-

tion practicable, as to the different systems of drainage and disposal of refuse, and report to the General Council, at their earliest convenience, the result of their investigations." It consisted of four physicians and four civilians, named in the ordinance. It was organized January 8, 1876, with Dr. J. P. Logan as president, and Dr. V. H. Taliaferro as secretary. On December 4, 1876, it submitted its work to the City Council. The larger portion of the volume is filled by elaborate reports upon "Sewerage and Drainage," by Ch. Rauschenberg, M. D., and "On Disposal of Excreta, Refuse, etc.," by W. T. Goldsmith, M. D. The whole evinces the deep conviction which has taken hold of the leading city in Georgia as to the necessity of sanitary reform. On p. 90 we find the following:

ODORLESS EXCAVATING MACHINES.—There are four or five different models of these pneumatic machines manufactured in the United States, under as many patents. One is made at Baltimore, others at Philadelphia, New Haven and Chicago. The "Odorless Excavating Apparatus" of Baltimore is in successful operation in Boston, Providence, Pautucket, New York, Brooklyn, Jersey City, Wilmington (Del.), Baltimore, Washington, Georgetown, Alexandria, Norfolk, Richmond, Charleston, Savannah, New Orleans, Memphis, Chicago, Grand Rapids and Detroit.

On the night-soil question, the following summary suits our circumstances exactly:

It is no exaggeration to say that this problem of the conversion of the excremental waste of towns and people and the refuse of factories into useful materials, is now engaging as much of the attention of intelligent minds throughout the world as any social question. The English press is burdened with publications on this general subject. Chemists, farmers, political economists, engineers, physicians, and amateur sanitarians, are all at work upon it. Towns and cities are making costly experiments to test the worth of all the various plans proposed. Stock companies are formed, whose business is, first, to make money for themselves at any rate, and secondly, to benefit the rest of the world by their ventures. From all this excitement, which will eventually extend itself to our crowded districts, we ought to derive much useful information, and should be able, removed as we are from the heat of the controversy, to see things as they really are, and to estimate the various plans at their value. But while it is of great importance that we duly note whatever may be seen or known in foreign countries, it is still more essential that all facts bearing on these questions among ourselves should be carefully observed. (Prof. W. R. Nichols, 4th Mass., p. 21, 1872.)

REMOVAL OF FILTH—KITCHEN GARBAGE AND SLOPS.

Next to a satisfactory solution of the night-soil problem, this is the grand sanitary difficulty in cities, towns and villiges. In country houses it takes precedence,—ignorance and stupidity oftentimes causing handsome dwellings, on splendid and healthy rural sites, to become quite as liable to the whole range of filth diseases as the worst quarters of illy-policed cities.

The main cause of the almost uniform ill condition of the rear half of the dwelling premises in Nashville and elsewhere, is owing to the hasty and careless disposal of garbage, and especially of slops. The latter are very frequently thrown from windows and doors upon the soil adjoining the house, or else carried by drains or hand a few feet further. In a short time the earth becomes saturated with filth, quite as polluting as is night-soil, for kitchen slops are composed of all descriptions of refuse organic matter, furnishing the elements of every conceivable noxious gas. Think for a moment of the numerous and complex group of compounds obtained in the chemist's laboratory from bituminous coal alone, and it will not cause surprise that, under the warm sun of American summers, so heterogeneous a mixture as kitchen slops, undergoing every stage of decomposition, right alongside dwelling, and especially sleeping rooms, should be regarded by all medical observers as a nuisance of the first magnitude.

Garbage, being solid and obvious and sometimes useful, causes less damage. In Nashville, however, owing to persistent neglect of law, it has occasioned great complaint from the inhabitants of the old, wealthy and crowded parts of the city, where it is a common practice to toss all kinds of vegetable refuse into the alley.

The whole subject of night-soil, kitchen garbage and slops has been very carefully studied by the Board of Health during its three years existence. The city government, by ordinance (dated June 18, 1877), has, to some extent, complied with the recommendations of the Board. This law, faithfully carried out, will place Nashville on a level with the best regulated cities, so far as

garbage and slops are concerned. Its effect upon the healthfulness as well as comeliness of the city cannot be doubted.

The impartial and rigid enforcement of this ordinance will put a stop to a nuisance which has given origin to more complaints, publicly in the newspapers and privately at the health office, than all else, the privy vaults alone excepted. It is the custom of quite a number to allow kitchen slops to flow into the gutters. Kitchen slops, garbage, and even dead animals are frequently got rid of by deposition in the drains. One of the oldest and most frequented eating houses in the city, for many years emptied all its kitchen slops into its cellar. When this laziness produced its natural results, rendering the building uninhabitable, an expensive iron pipe was arranged so as to convey the slops to a drain in Cherry street. Neither tenant nor landlord thought it wrong, for it is so common to see garbage of all kind, corn shucks, *et id omne genus*, chucked in at the mouth of drains, that they could have no idea of liquid slops being out of place there. There can be no doubt, however, that the offensive odors escaping in hot weather so freely from the openings of connecting gutters with underground drains, proceed from the decomposition of this mixed mass, under the favoring influence of darkness, heat and moisture, going on close to said openings. The contents of water-closets probably have little to do with this nuisance. These are so diluted with water and emptied into the drains at such points as to pass freely on without giving offense.

In all our cities the lesson is yet to be learned, that drains and sewers are totally different constructions for entirely different purposes. Drains are to remedy dampness, sewers are to remove filth. They should be kept distinct.

FILTH NOT FIT FOR FILLS.

In Nashville, a most reprehensible practice has long prevailed, both on the part of the city authorities and of private parties. It is the custom of making the "fills" for streets and building sites on the low grounds, embraced by portions of the first, third, sixth and fourth wards, from whatever material comes readiest to hand. Stable manure, ashes mixed with garbage,

night soil and all household filth, together with street cleanings and the offscourings of filthy cellars, enter very largely into the composition of these fills. These fills also are in the lowest, and most ineligible portions of the city, being subject to frequent overflows from headwaters and backwaters. Precisely that portion of Nashville which ought to be most carefully reclaimed and protected from defilement. There is no excuse whatever for this gross violation of common decency, which is literally laying the foundations for the whole tribe of filth diseases, in a region already thickly peopled, and soon to be the heart of a large city. The best of materials, good stone and clay, is close at hand, and should alone be employed in making fills. The low lands south of Broad street, limited in extent, and very convenient for the purpose, will soon be raised above high water mark by the material obtained in cutting down the hills on either side. The low lands within and without the limits on the northwestern corner of Nashville, are traversed by three great railway lines, furnishing every facility for redeeming a large area at moderate cost.

It has long been a matter of surprise to many that the railway companies have not selected all this lowland for shops, Union Depot and other purposes. Nearly void of buildings, it can be purchased cheaply. The companies would reap the full benefits of their improvements, by sale of what was not needed for railway purposes.

Professor Bowling has suggested a plan by which these lowlands may be converted into a park, with a basin of fresh, not stagnant water. The whole surrounded by spacious avenues, lined with trees, and furnishing excellent facilities for boating, promenades and drives. At the base of the Capitol Hill, it can be so contrived as to make an improvement continuous with the costly and beautiful, though diminutive park, which surrounds the State House, and overlooks a charming expanse of country.

Recent reports, both of State and City Boards, attribute the increasing death-rate of Boston to the new made lands lately created there with impure materials. Much of the well known unhealthfulness of Charleston is attributed by its physicians to negligence in making fills. The Board of Health of New York City expresses the general sentiment of medical authorities upon

this subject, in the following minute, adopted February 10th, 1874:

WHEREAS, It is represented to the Board that ashes, garbage and street filth are being dumped upon lots within the city limits; and,

Whereas, In the opinion of this Board, such dumping is dangerous to life and detrimental to health, therefore,

Resolved, That the Board of Police be and are hereby respectfully requested and ordered forthwith to discontinue the dumping of ashes, garbage and street filth within the limits of the city of New York.

Resolved, That the Board of Police be and are hereby requested to cause the arrest of all persons dumping ashes, garbage or street filth within the limits of the city, without a special written permit so to do from this Board, save and excepting in cases where the ashes are absolutely clean, inoffensive and not mixed with other material.

WATER SUPPLY.

The human body being composed mainly of water, in fact a collection of tissues constantly bathed and receiving nourishment by and through an ever flowing stream of water, it is logical enough that an ample supply of pure drinking water should be the first, not only of sanitary but economical, considerations. There is never difficulty in getting public attention to this subject. The greatest engineering feats of oriental, classic, and modern days are of its development.

As long ago as 1833, Nashville, through a distinguished scientific engineer, Albert Stein, constructed a very complete water works. Very few cities in America, probably none in the South, had at that early day taken a step so far in advance. This establishment has been enlarged several times. When Nashville was a great military depot (1862—1865) and hospital centre these works furnished a supply lavish in quantity, and never objected to by those using it as to quality. The fact is, that the Cumberland river furnishes as good and wholesome water as can be got anywhere, except from certain lakes. The great objection to it is, that so often it becomes laden with mud, indeed after every heavy rain. This makes it uncleanly and unsightly, and doubtless in some cases unhealthy.

Within the past ten years the machinery has become impaired by age. Also the city steadily growing southward has caused well grounded fears that the river is occasionally, and will be-

come permanently, polluted above the pump-house. Hence for a year past the Board of Health has favored the constant agitation of this subject by the people. As a result, all the steps are taken for a new engine capable of supplying fivefold the present population of Nashville. Measures are perfected for procuring the water from a point above all possibility of foulness. At the same time a filtering apparatus will be added, of novel and peculiar features in several respects. As a result of the whole series of works, Nashville will be provided with an ample supply of water equal in purity and all good qualities to that of any city in the land.

This subject is fully discussed in the report of Professor Lupton, to which the reader is referred for much interesting information and valuable analyses.

WELL-WATER IN CITIES NOT POTABLE.

Benjamin Franklin, the practical scientist, profound philosopher and successful philantrophist, whose life-time work left an ineffaceable impress upon Philadelphia, was among the earliest to call attention to the fact that wells situated near collections of dwelling houses, would of necessity become so contaminated that the water would not be fit for drinking. This subject has been so minutely and practically investigated as to leave no doubt upon the subject.

In Nashville it is one of great moment, and must not be blinked. There are fully six thousand of our people who use well water or that from springs. Springs furnish water to 787 families, and wells to 358 families. These families are all among the poorer classes, and will average at least between five and six in a family, making in all more than one-sixth of the entire population. Excremental filth, impure water and dampness are the three curses of Nashville. These may all be removed at less cost than has been expended on any one of the railroads which centre here, and make this an available point for no mean city.

The papers of Professors Lupton and Safford will give the scientific reasons why this use should be prohibited. The character of the geological formation, as well as the topography *of Nashville* is such, that all these wells and springs are liable

to constant or occasional but most foul pollutions from drains and privy vaults, or from surface washings. Well authenticated instances are known of rags or other matter being conveyed from privies, by underground channels, to springs half a mile off, and in a very short time. It is a well known fact that there are quite a number of old fashioned deep receptacles for human excreta, used by large families for many years, which need no scavenger, being emptied by every heavy rain. The inferences are obvious.

The wide-reaching consequences of the above facts, and the absolute duty laid upon the city government of furnishing the multitudes who now use water either polluted all the time, or liable to gross pollution at any time, with pure river water at reasonable rates, will be obvious when the generally received opinions of the medical profession are studied.

Dr. C. F. Chandler, of New York, one of the highest American authorities as a practical investigator and chemist, and President of the New York Board of Health, says (see Reports of Public Health Association, p. 539):

The products of the decomposition of animal matter in water is, however, by far the most objectionable impurity. Organic matters, produced by the decomposition of vegetable substances, are not especially dangerous, but the products of decomposing animal substances are highly dangerous, even when in minute quantities. These impurities do not make themselves apparent to the taste. On the contrary, such waters are frequently considered unusually fine in flavor, and persons go a great distance to procure them. Nevertheless, they contain an active poison. Many diseases of the most fatal character are now traced to the use of water poisoned with the soakage from soils charged with sewage and excremental matters. Sudden outbreaks of disease of a dysenteric character are often caused by an irruption of sewage into wells, either from a break in the sewer or cesspool, or from some peculiarity of the season. Such contamination of the water is not indicated by any perceptible change in the appearance of the water. The filtered sewage, clear and transparent, carries with it the germs of the disease. At a convent in Munich, thirty-one out of one hundred and twenty-one of the inmates were affected with typhoid fever. It was found upon investigation that the well was polluted by sewage, and the disease disappeared as soon as the proper repairs were made.

Dr. J. A. Steuart, well known by reason of energetic and successful work as Commissioner of Health, takes positive ground in Baltimore Report, 1876, p. 16:

When the startling fact is stated, and properly understood, that in the very nature of things it is an impossibility that there should be a single subterranean

stream (such as supply springs and wells all the world over) flowing under the seventeen square miles of territory upon which the city of Baltimore stands, that is not contaminated, to a greater or less degree, by the innumerable privy wells which honey-comb its entire surface, the public mind will be convinced of the necessity for the ultimate abolition of every pump within the city limits. It is estimated that there are about 80,000 houses in the city of Baltimore, each house having its privy pit. Of the seventeen miles square, it is estimated that only about 10 miles square are occupied by houses. By a division of this latter space by 80,000, it gives an area of only 60 feet square to each privy pit. How is it possible, therefore, for a single artery to escape pollution when most of these pits are purposely "dug to water," thereby insuring the very calamity most to be dreaded by a civilized community? It is hardly necessary to advert to the soil saturation produced by this system of privy pits, spoken of in my last report. It is self-evident that this system, and the use of pumps or springs for drinking purposes, are wholly incompatible.

Dr. Frank Wells, in the masterly Cleveland Report, 1876, pp. 39–45, among other points, gives the following, most pertinent to the argument in hand:

Of all sources of water supply, wells are the most dangerous, particularly in towns and cities, on account of the ease with which their waters become polluted, and thus cause disease.

The reason why well-water is so frequently bad and unwholesome, is because sink drains, badly made house drains, privies, cesspools, etc., empty their foul contents into them by percolation through the soil, particularly if it is a porous one, and has an underlying stratum of clay or rock, which furnish an excellent bed upon which liquids can flow.

The most fruitful cause, however, of water pollution is the privy vault, which, in a similar manner to the cesspool (which is nothing but a privy), affects the health of communities which depend upon well-water for drinking purposes. This is a serious evil, on account of its extensive prevalence, and one which is considered of all filth influences which prevail against human life, to operate undoubtedly to far the largest extent.

We have only to reflect upon the usual method in which these vaults are constructed to recognize the truth of these assertions. They are ordinarily nothing but a receptacle, dug to a greater or lesser depth into the ground, with no other walls but those which the earth furnishes. Even if they are walled in with wood or brick, which is not common, it makes but little difference, for their liquid contents will, in either case, escape through the soil to poison both the neighboring wells and the air by their gaseous emanations. All this, with the open clearing out (an evil which in this city is about to be discontinued), creates a nuisance, which persons, unacquainted with its operation, can scarcely realize, since "the infectious pollution of the water and air, which it occasions throughout all countries, are efficient means in spreading many fatal filth diseases."

If the pollution of our drinking water could always be made manifest by a disagreeable odor or unpleasant taste, the danger to health would be infinitely less, for under these circumstances most persons would discontinue their contaminated supply. But unfortunately the dangerous character of these waters

is often indicated neither by the odor nor taste of impurities. The fact that a water is clear and palatable, is no proof whatsoever of its purity, since these conditions have been markedly present in some waters most shockingly polluted with sewage, as indicated by microscopical and chemical examinations. Some of the most dangerous waters are especially bright, sparkling, and refreshing, but "the chemical process which may have made them so, may have had no effect upon the "germs of disease which they contain," and which have been known to produce the most dangerous results.

In only one out of the large number of well waters which I have caused to be examined this fall and winter, was there anything which would have possibly indicated, either to the sense of smell or taste, their dangerous character, and yet they were all so polluted with privy filth as to be totally unfit for use. Every one of the specimens of well-water which I have had examined this winter, on account of the fatal prevalence of diphtheria in the families using this water, was contaminated, and some of them to a very great degree.

How great an evil impure water is considered by observing physicians, appears from a remark of Dr. J. F. A. Adams, 6 Mass., 1875, p. 300:

The evidence that a great amount of disease, especially typhoid fever, is induced by drinking-water polluted by drains, privies, and cesspools, is constantly accumulating. It can be found in all the previous reports of this Board, and all sanitary literature abounds with it. The number of cases of sickness, and even of death, occurring annually in Massachusetts from this cause is certainly enormous.

Dr. F. Winsor, 7 Mass., p. 267, 1876, calls attention to a very important point in practice:

The fact that a water is clear and palatable is no proof whatever of its purity, these conditions being markedly present in some well-waters shockingly polluted with sewage, as shown both by ocular inspection and chemical analysis; and further, a water may be found by the chemist to be fouled by sewage, and yet neither he nor the microscopist be able to say whether it carries the specific poison of certain diseases; for example, typhoid fever and cholera.

Dr. George Derby, 1st Mass., p. 50, 1869, urges a consideration of great weight:

We often, for instance, hear it said by persons in apparently sound health, that the conditions under which they live must be good and healthful, because they do not suffer. Much self-deception is practiced in this way. Unwholesome influences may for a long time be resisted by a vigorous constitution, yet the time at last arrives when they show their power. In such cases, we may often observe the effects upon children when they are not evident in the parents. In fact, it may be taken as a rule that the condition of young children is a sensitive gauge of the sanitary influences of a district or neighborhood.

The topic of pure water occupies much space in this Report,

because, beyond question, it is one of vital importance to Nashville. The old Board of Health devoted great attention to this subject, and endeavored to arouse the people to action. See "Report of Committee on Hygiene," August 26, 1866. This was printed in the dailies at the time. It is largely quoted in U. S. Report on the "Cholera Epidemic of 1873," pp. 143–5. The present Board has kept the subject constantly before citizens and municipal authorities. August 11, 1877, is the date of the ordinance which at last crowns these efforts with success by providing for an aqueduct to bring the water from above all contaminations, and filtered through a gravel bed. The total cost for new engine and aqueduct will be just about what was voted for the engine alone in September, 1876, that is, $110,000. Physicians of large practice and much learning now urge the consideration that this great improvement will accomplish but half its work unless wells and springs cease to be used for drinking purposes.

CHOLERA AND WELLS.

The observer cannot but be impressed, when summing up the history of cholera in Nashville, with the light thrown upon it by the now generally received hypothesis, known as the germ theory. When a student of medicine, I read Holland's profound essay on animalculæ and disease,* and was impressed by the fitting explanation it gave to phenomena witnessed here. In 1833, Nashville did not extend beyond Line Street on the north, Broad Street on the south, Spruce Street on the west, and the Cumberland on the east. It was a small, compact, crowded town, built on a rock. The epidemic of that year was diffused in every direction around the city. In 1849 and '50, the suburbs had greatly increased. The centre, which in 1833 was all the city, now comparatively was exempt. The suburbs south, west and north were severely scourged. Now observe, that in the autum of 1833, the Water Works erected by the Corporation were finished. Early in 1833, *old* Nashville had only well water and suffered. In 1849 and 1850, the suburbs had mainly well water and suffered. Hence in 1854, South Nashville voted for Annexation, so as to

* See "Medical Notes and Reflections." By Henry Holland, M. D.; F. R. S., 1839. Chapter XXXIV. On the hypothesis of insect life as a cause of disease.

get hydrant water. Again in 1866 and also in 1873, the same facts occur on a still more notable scale. The epidemic is always more and more prevalent on the outskirts of the city; always less and less violent within the central, crowded precincts, which, however, as to privies, filth, etc., are in a very bad sanitary condition; while the suburbs are open, well aired, and often sightly as to location. The geological character of Middle Tennessee makes it easy enough to understand how wells are readily and rapidly poisoned by human excreta.

THE PREVENTION OF DAMPNESS.—DAMPNESS AS A CAUSE OF DISEASE.

Next to godliness is cleanliness, said Wesley. The apothegm has become an axiom. With equal truth may it be said that next to cleanliness is dryness. Never a damp house or a damp city without sickness. All observers have admired the healthfulness, longevity and fertility of the early settlers of Middle Tennessee, and also their children. These hardy and brave pioneers, facing dangers of every description, lived to be sept and octogenarians. They brought up large families of children, ten, fifteen, sometimes twenty in number. To-day these children are just stepping into the grave, having in their turn given to the country full tribute of healthy sons and daughters. What a proof of practical sanitary perfection! Go back a century, or half century, and we can easily understand the why and wherefore. The emigrant immediately made a clearing. He thus let in air and sunshine. He built his dwelling upon a hill-side. Water always drained off. His cabin was of logs. Ventilation perfect. Immense forests of best timber were to be got rid of. Fuel was plenty. The large open fire place kept the interior dry summer as well as winter, for cooking was a daily process. Malaria was completely baffled. Indeed Middle Tennessee was then a Sanitary Paradise, as it ought to be at this day.

Dampness, one of the most universal causes of sickness and death, is also one of the most overlooked. It is one of the main causes why houses on high plateaus become very unhealthy, notwithstanding the repute of the region. Here again it must be noted that very often science is as much neglected in isolated

rural dwellings as in crowded cities. Always with the same results. Consumption, diptheria, and all the catalogue occur. Ignorance thinks of mystery. Under the steady, truth-piercing gaze of science, mystery disappears. A cause is found, and the means of prevention made known.

Among the diseases notably caused or favored by undue moisture in soil and air, are malarial fevers, consumption, pneumonia, typhoid fever, rheumatism, neuralgia, scrofula, cerebro-spinal-meningitis. A glance at this list is enough to show the superlative importance of preventing dampness.

As an able pioneer in sanitary measures, and a veteran physician of Nashville well remarks, the above diseases are enemies everlastingly at work, which inflict the torments of hell upon multitudes, and are much more to be dreaded and combated than cholera. We can with certainty promise their abatement by science in Nashville; as has been the case in many other cities.

The causes of undue dampness in Nashville, are: First, a number of small ponds and pools of stagnant water on the outskirts of the city. This is regarded as so great a sanitary evil, that it is, in Massachusetts, abated by a law of general application. All persons in our vicinity endangered by these ponds should, without delay, seek a remedy from the proper Courts. The evil is indeed quite local, but first class in degree.

A second cause of dampness, everywhere on a small scale, but occurring in all parts of Nashville, more especially in the central wards, is the waste water from hydrants. Very seldom is this properly drawn off. It often accumulates in a marsh upon the premises. Sometimes it is guided to the nearest alley, which receiving several such tributaries becomes a long ribbon-shaped marsh. Again, it is sent to the gutter in front, where it most frequently remains and stagnates. Two millions of gallons are daily pumped up from the Cumberland, and incidentally used so as to convert hundreds of otherwise dry lots into marshes, just as bad as far as they go, as any of our creek or river bottom swamps. In a few words, a gigantic evil is here portrayed, adding greatly to the death-rate, and causing untold tortures to hundreds who suffer grievously in person and in pocket from intermittents, etc. An ample supply of water brought into a city always does harm in this respect, unless a way for it to get out is also provided.

The defective condition of the gutters and alleys is another cause of dampness. The former are very often unfinished; and even when completed, are allowed to be obstructed from carelessness, or by little boys for amusement. Though at first sight this may seem a trivial point, it is far from being so. Let any one place himself, during a heavy rain fall, in this climate so often occurring, and notice how a few rocks damming the well-built gutter will deflect a torrent of rain into the street, which is washed up and even gouged out by its scouring power. Annually Nashville and the Street Car Companies are damaged to a large amount by the gross carelessness hitherto exercised in this respect. As in Richmond and elsewhere, the law should require all property holders, by their tenants or agents, to keep the gutters in front of their premises unobstructed, as well as the sidewalks free from snow and filth. The sanitary code of Nashville is very deficient here.

The alleys become marshes in the way just mentioned, and also from the rain-fall, because in many cases not properly graded and paved. Indeed so narrow, so unfinished, and so poorly policed are these public highways, as to have become a synonyme with our people for all that is stinking and unsightly. They can be made very useful and not unsightly. In a large portion of the city they can be made twenty feet wide. When paved and graded they will be efficient surface drains, and a great relief to the over-narrow streets, for traffic.

A fourth defect, small in detail but very great in the aggregate, causing very much of avoidable dampness in Nashville, is the singular custom, almost universal, of stopping the down spout at the surface of the pavement instead of conducting it underneath to the gutter. Thus the entire sidewalk is kept wet, and the foundation and lower walls of the houses saturated with moisture so effectually as not to get dry between the rains. This is bringing dampness very close to the bodies of the inmates. A brief ordinance, duly enforced, would speedily correct all this. A great sanitary blemish, hitherto entirely ignored, is here pointed out. The practitioners of Nashville, no less than the mortuary tables, will testify to the necessity and value of the suggestion.

Last, but far from being least, as a cause of dampness, are the cellars of Nashville. Nearly all the deep cellars are wet. This

results from the geological character of the site, and from imperfect construction. These cellars have ordinarily been excavated and built over long before any sewers or drains were dreamed of. Damp and badly ventilated, they rot out the floor just above, and become receptacles of filth too seldom inspected and cleaned. No cellar should be under a house where proper drainage cannot be had. In the drained portions of the city, builders should be prohibited from making cellars deeper than the drains. This subject well merits an essay. All that can be done here is to call public attention, and to encourage that public by the statement, that though a great evil it is one readily abated.

THE PREVENTION OF DAMPNESS.—DRAINAGE.

The removal of filth, the supply of water, the prevention of dampness, have been mentioned as the three great aims of practical public hygiene. The first is enveloped with great practical difficulties. The second, requires great works and large expenditures. The third, though not inferior in beneficent results to either, has been brought to a high degree of perfection, and in a city like Nashville, need not be inordinately expensive. Proper underground and surface drainage carries off all superfluous and waste water, prevents dampness, keeps houses dry, and does away with much sickness and death. The water supply question being now as good as settled, the next subject for constant agitation at the fireside, in the press and on the forum, will be that of drainage. It is a vital question for Nashville. Vast and attractive as is the subject, it must now be passed by with a reference to the valuable chapter upon it in Dr. Frank Wells' Report, before alluded to, and with a few citations from the Massachusetts and Michigan Reports. The eight reports of the State Board of Health of Massachusetts, and the four reports of the State Board of Health of Michigan, contain a mass of information of the highest practical value, prepared by experts, thoroughly conversant with European authorities, but perfectly aware that they are working in America and for Americans. If the intelligent professional and business classes of Nashville could read these reports, or would come together and listen to readings from their pages, *sanitary* reform would proceed with no limping pace as heretofore,

but with a steady, earnest, vigorous step. All would be convinced that it is the way to place Nashville on a basis of permanent prosperity and lasting growth.

The inquirer may also be referred to Dr. A. N. Bell's "Sanitarian," an indispensable current repertory; to the volumes of the "Public Health Association;" to the numerous City Reports, especially those published by the Board of Health of New York, elaborate, splendidly illustrated, and fully indexed: and to many treatises on special topics. These, with the standard works on Hygiene, form a mass of literature, consulted and studied with keen interest by a multitude of earnest men in all portions of America. Our own community is as yet very poorly supplied with these works. The State Library has many valuable reports received from other State governments. If properly preserved and arranged, in time these will constitute an invaluable collection. At present the Librarian furnishes all possible facilities.

DAMPNESS, DISEASE AND DRAINAGE.

Dr. H. J. Bowditch, the distinguished President of the Massachusetts State Board of Health, by a long, extended and minute series of observations, has demonstrated the bearing of dampness upon consumption:

> He has clearly shown that among the prominent causes of consumption is exposure to *soil moisture*. This conclusion is derived from a careful comparison of statistics furnished by physicians in all parts of Massachusetts, and is a result of such comparison exclusively. There were no preconceived ideas, and no previous suspicion was entertained of the existence of any such law. A singular confirmation of its correctness has recently come from England. In 1865 and 1866 inquiries were made, under government authority, into the effect of drainage works and other sanitary regulations designed to promote the public health. In pursuance of this inquiry, twenty-four towns were selected in which improved drainage had been established. It appeared that, while the general death-rate had greatly diminished, it was most strikingly evident in the smaller number of deaths from consumption. Dr. George Derby, (1st Mass., p. 46-) 1869.

Dr. Buchanan, so eminent in Great Britain, by a series of independent observations, came to the same practical conclusions.

These are facts of great importance to Nashville. With our advantages of climate, consumption should not figure so high in the mortuary record. Nor will it when Nashville is properly drained.

The evils of damp cellars are well epitomized by Dr. F. Windsor, 7 Mass., p. 227, 1875:

The class of diseases most frequently in connection with damp or wet cellars "is inflammatory disease of the respiratory organs," especially bronchitis. Next in order of frequency comes rheumatism, more particularly of the sub-acute order. Phthisis, pneumonia, and wasting chronic perversions of digestion are also found by many of our correspondents to be common over such cellars. Also a lessened power of resistance to all diseases when contracted. No observer can doubt that a large amount of preventable disease is caused by damp cellars. A good system of sewerage very generally cures the evil, and no town which has reasonable expectations of ever needing sewerage, should allow any dwelling to be built at an undrainable grade. Even where population seems destined to remain small and widely scattered, public opinion should insist on the necessity of good drainage for every dwelling. No town can afford to have house after house built with no provision for keeping the ground beneath it dry, and so far maintaining the health and producing power of its inhabitants. If we had enlightened local boards of health, ordinances would soon become common, which would require that every new dwelling should be examined and approved by a health official, as to this requirement of drainage, before it could be inhabited. The expense of securing proper drainage is small, except in localities altogether unfit for habitations, and the return in exemption from disease is unspeakably valuable.

Detroit furnishes a striking comment on the connection between drainage and health:

The public sewer system was inaugurated in 1835. Up to 1872 there had been built 38 miles 239 feet and 6 inches, costing $996.940.56, from public funds. From 1855 to 1872 inclusive, and paid by assessment, 41 miles and 3,190 feet, costing $267,949.79, making a total of 79 miles 3,429 feet and 6 inches, at $1,264,890.35. Since that time we estimate an additional 13 miles and 188 feet, costing $468;297.63, making 92 miles 3,617 feet and 6 inches, costing $1,733,-187.98. This system has been organized upon an extensive scale, so as to allow of complete drainage should the city extend itself two or three miles in any direction beyond its present boundaries. The sewers are being constantly extended, as demanded by the needs of the citizens. In order to show the estimation in which they are held by the community, I quote the following from the First Annual Report of the Board of Public Works for the year 1874: "There have been 715 connections made with public sewers during the year, from which there has been collected and paid into the city treasnry $1,430.00. From the promptness with which the citizens avail themselves of the opportunity afforded in draining their premises, it will be seen that they are fully aware of the advantages to be derived therefrom, not only in a sanitary point of view, but also with a view to enhance the value of their property.

It is a well settled fact that localities where drainage has, from any cause, been imperfect, the people are more or less affected with fevers and diseases of a kindred character, but where ample drainage is afforded, it is evident that the *disease* subsides with the extension of drainage. The Board have made it a

point to keep pace with the growth of the city in extending sewers, as required by citizens.

The land to-day, two and one-half miles from the river, is fairly drained, although the sewers have not, except upon Woodward Avenue, been projected fully to that distance.

The low spots, wherever any such existed, have been or are rapidly being filled with earth, and but few surface basins are now to be found within the limits of the city, and these are unimportant, and can only be observed for a few weeks in the spring. I doubt whether more than two or three can be found at that time, and these do not altogether cover as many acres. Persons living near any natural surface basin, noticing the fact that the water does not get exit by means of the sewers in the neighborhood, from the want of ditching, soon call the attention of the Common Council to the fact, and a resolution is always promptly passed, ordering the nuisance abated on account of the injury to the public health. Dr. H. F. Lyster, Third Michigan, p. 151.

The remarks of Dr. W. L. Barrett, Health Officer in St. Louis, Report 1876, p. 33, applies with equal force to Nashville:

Stagnant water, damp cellars, obstructed sewers, or obstructed natural outlets for water, mark the place of inevitable disease and death. All admit sewerage and drainage are of first consideration as a sanitary measure; but what is not generally understood, is, that sewerage and drainage are two distinct and separate things. We are disposed to regard a thoroughly sewered district as a thoroughly drained district. This is a great and fatal mistake. Sewers are almost, if not perfectly, water-tight drains that permit comparatively little water to percolate into them, and while they are of vital importance to carry off surface and waste water, they do not fully answer the imperative requirement of draining the soil. Subsoil drains, on the other hand, are culverts made of dry stone masonry, or of some porous material, that permits the water saturating the soil, to drain into them. Culverts such as these should be constructed through and across valleys of natural drainage, to prevent water saturation, fetid, damp exhalations, and the permanent deposit of decomposing organic matter, and to carry off from the soil liquid refuse from the overflow of cesspools, privies, etc., whose dirty and disgusting deposits, if not checked, produce only sickness, disease and death. From every spring, through every natural drainage course, and through every artificially filled basin, should be constructed a well-built, dry stone drain, until a sewer is found low enough to receive its contents.

The exact distinction between sewers and drains is concisely expressed by Dr. H. F. Lyster, 3 Mich., p. 15:

Sewers are intended to be constructed so as to prevent their contents, the sewage and sewage gas, from escaping through their walls, consequently they are composed of glazed pipe, hermetically sealed at the joints, or when large, of bricks covered with cement of impervious water lime. They do not drain the ground, as the water cannot find its way into them.

It has been proposed to build two systems, one for sewerage and the other for drainage; but I am not aware that this plan has ever been adopted, on account

of the expense attending its construction. The same purpose could be attained in most localities, not within city limits, by means of tile drainage connecting with lateral sewers. This idea is now carried into practice by the construction of tile drains around the basement layers of the foundation of well constructed buildings. That the thorough drainage of the soil in cities is essential to the best sanitary condition, is too evident to even merit a detail of the many and various reasons, so apparent are they to every one.

In Nashville we have drains and no sewers. The latter should be of vitrified earthenware pipe. The same system of excavations will probably serve for both.

AIR SUPPLY.

It is a remarkable practical anomaly that nature's most lavish and needed gift—fresh air and sunshine—should be an object of peculiar anxiety and difficulty with all sanitarians. Yet such is the fact. The ancients seem to have understood this matter in practice at least much better than we do. It is only since the invention of gas apparatus by Hales, and the wonderful chemical discoveries of Priestley, that the moderns have understood the difference between pure and foul air. These great men really laid the foundations for the marked improvements of vitality and longevity in all Europe and America. Not a city in Christendom but owes them a statue.

Man is momently breathing in and breathing out atmospheric air. In this process the air is polluted, so that each adult requires a constantly new supply, say, at least fifteen thousand cubic feet daily, or a room full fifty feet long by twenty wide and fifteen high. The first essential is that the air thus breathed be pure at the beginning. This is really the main aim and end of those pre-eminent works the removal of filth and the prevention of dampness. Filth and dampness are the chief air polluters and vehicles of contagion. These are out of door measures chiefly. The poison caused by the natural process, respiration, must be guarded against within doors. Here comes in the wide theme, ventilation. Private hygiene is no less concerned than public. The field for the latter wide-reaching and imperatively demanding attention, is the overcrowding of houses and individuals. The whole class of dwellings so well and opprobiously known as "tenement houses," need rigid regulation. A subject of vital importance to Nashville as well as all other cities; one which

gives the poor a claim upon the law-maker not to be shirked; one which if neglected will finally compel our wealthy citizens to desert their handsome residences around the Capitol and other central points, and remove to the suburbs or country.

A great mistake prevailed in the original planning of Nashville. It was laid out on a narrow ridge, between two spring valleys. Consequently the streets are hardly wide enough for alleys, and the lots every way too contracted. Hence the necessity of urging our people to be more liberal in allowing building room. This mistake should not be repeated in the new portions of the city. Rather the examples of Louisville and Cleveland should be imitated. These cities contain miles of streets, on which the houses occupy a half acre or more, with beautiful lawns in front and complete yards in rear—virtually parks with dwellings, attracting the unbounded admiration of all visitors. The niggard allowance of land to dwellings, let it be repeated, is a blemish, and an unpardonable one, in Nashville.

TREES AND PARKS.

In this connection, as aiding in the supply of pure air, attention should be given to the cultivation of trees and the opening of parks. Previously to 1860, all the country immediately adjoining Nashville was a natural park, equal to any of those artificial parks so celebrated in Europe, for beauty of trees and variety in surface. The fell hand of war changed all this. On three sides the city is surrounded by bleak hills. The owners of these extended tracts would do a good sanitary work and greatly improve their property by planting hardy trees, so as, in a few years, to convert these hill-sides into eligible building sites.

In one respect Nashville is peculiarly fortunate, namely, in the existence of four great educational institutions within or close to the city limits. These together have an aggregate of 158 acres. In time these grounds will be highly adorned, and will always contribute to the material beauty and comfort of the city, as do their occupants to its intellectual growth and development. Only one of these, however, is within the city, namely, the old University. This has about twenty-two acres in the Seventh

ward, contiguous to a large population. Its trustees should be encouraged to hold it intact, except for educational buildings.

The central crowded city has only the singularly contracted grounds around the capitol,—beautiful indeed, but on an infinitesimal scale for a State park. To this should be added a breathing place for the business men of the Public Square, who do so much in every way for Nashville, and who, during our long summers, spend so many weary hours sauntering in their huge warehouses. The river front between the Methodist Publishing House and the railroad bridge, should be secured for this purpose. It could be readily converted into a picturesque esplanade. It commands a fine view, and would at once become a popular resort.

A single tree is a beauty. It is a congeries of individual lives, united by a common bond. It is a fit emblem of the civic community, where each individual thrives or pines as the whole flourishes or decays. The hardy and fast-growing natives of Tennessee forests should occupy many a sunny corner and station along the streets. So much importance do the wise men of Richmond—which, more rapidly than any other Southern metropolis, is arising from dust and ashes—attach to this subject, that the planting of trees is encouraged by premiums given by the city government. The Fourth, Seventh, Eighth, Ninth and Tenth wards of Nashville and all the contiguous suburbs have much at stake in the above suggestions, and should not lose a season in acting upon them. The ancients considered that man a public defaulter who failed to plant a tree. In New England many a name, like that of Hillhouse, is held in lasting and grateful memory because of tree-plantings. As long ago as 1849, Everett, the classic orator and educator, urged, in words which have caused many a noble tree to bask in heaven's sunshine, this topic to popular attention:

> Avenues of trees, planted for ornament and shade. This point is worth the particular attention of our fellow-citizens in the country. Till lately, perhaps, this generation, following the bad example of the last, has not done quite so much in this way as might have been wished. It is a kind of instinct in the settlement of a new country, to destroy trees; and it takes a good while to restore to the community a disposition to spare, protect, and propagate them. Some public-spirited individuals, however, in our country towns, began to think of *this matter* in the middle of the last century. There are in the interior of New

England a great many noble trees, planted eighty or one hundred years ago; and most certainly nothing grows out of the earth, and man can put nothing upon it, so beautiful. I hope, my friends, we shall let our children and grandchildren enjoy the great comfort to be derived from this source. Sir Walter Scott represents one of his characters as saying that his father used to tell him to be always putting down a tree. "It will be growing, Jock, when you are sleeping." It will be growing, sir, when we are sleeping to wake no more. The acorn which you cover with a couple of inches of earth, the seedling elm which you rescue in your garden from the spade, will outlive half a dozen of our generations. Cicero speaks of it as a kind of natural foresight of the continued existence of man, that man "planted trees which were to benefit a coming generation."

Dr. Stephen Smith, very high authority, discussing the effects of high temperature (New York Report, 1872, p. 397), says:

The power of trees, when in leaf, to render harmless the poisonous emanations from the earth, has long been an established fact. Man may live in close proximity to marshes, from which arise the most dangerous malaria, with the utmost impunity, provided a grove intervene between his home and the marsh. This function of trees was known to the Romans, who enacted laws requiring the planting of trees in places made uninhabitable by the diffusion of malaria, and placed groves serving such purposes under the protection of some divinity to insure their protection.

In large cities, where animal and vegetable decomposition goes on rapidly during the summer, the atmosphere is, as already stated, at times saturated with deleterious gases. At the period of the day when malaria and mephitic gases are emitted in the greatest quantity and activity, this function of absorption by vegetation is most active and powerful. Carbonic acid, ammoniacal compounds and other gases, products of putrefaction, so actively poisonous to man, are absorbed, and, in the process of vegetable digestion, the deleterious portion is separated and appropriated by the plant, while oxygen, the element essential to animal life, is returned to the air. Trees, therefore, in cities, are of immense value, owing to their power to destroy or neutralize malaria, and to absorb the poisonous elements of gaseous compounds, while they emit the oxygen.

The conclusion from the foregoing facts is inevitable that one of the great and pressing sanitary wants of New York City is an ample supply of trees. It is, in fact, destitute of trees; for the unsightly shrubs which are planted by citizens are, in no proper sense, adequate to the purpose which we contemplate. Its long avenues, running north and south, without a shade tree, and exposed to the full effect of the sun, are all but impassible at noonday in the summer months. The pedestrian who ventures out at such an hour finds no protection from an umbrella, on account of the radiation of the intense heat from the paved surface. Animals and man alike suffer from exposure in the glowing heat. Nothing mitigates its intensity but the winds, or an occasional rain-storm. And when evening comes on, the cooling of the atmosphere produced by vegetation does not occur, and unless partially relieved by favoring winds or a shower, the heat continues, but little abated, and the atmosphere remains charged with noxious and irrespirable gases. It is evident that shade-trees, of proper kinds, and suit-

ably arranged, supply the conditions necessary to counteract the evils of excessive heat. They protect the paved streets and the buildings largely from the direct rays of the sun; they cool the lower stratum of air by evaporation from their immense surfaces of leaves; they absorb at once the malarious emanations and gases of decomposition, and abstract their poisonous properties for their own cousumption; they withdraw from the air the carbonic acid thrown off from the animal system, and decomposing it, appropriate the element dangerous to man, and give back to the atmosphere the element essential to his health and even life.

Dr. J. G. Cabell, President of the Richmond Board of Health, in 1876, urges tree-planting:

It will be remembered that the Council, some few years since, offered a premium to any person who would plant and successfully rear shade-trees in front and on the sides of their premises,—a measure tending to improve the beauty of the city and its healthfulness. Much concern has been most justly created by the partial destruction of the trees in the streets of the city in straightening the curbstones which have been displaced by the growth of the trees. The desire to preserve the symmetry of the streets in this way jeopardizes the comfort and health of its citizens. By this operation many a graceful and beautiful tree has been destroyed, and the cost and attention bestowed upon it been completely lost. We advise that citizens be empowered and required hereafter, in planting shade-trees on the side-walks, to place them further on the side-walks from the curb-stones—the distance to be fixed by the City Engineer.

Like ground is taken in St. Louis Report, 1876, p. 36:

Shade trees are of great sanitary value. They moderate the temperature of the atmosphere, and also neutralize the malarial exhalations from the soil. They equalize the temperature by protecting the earth from the direct rays of the sun, and by preventing solar irradiation, and are, therefore, of immense importance in cities where the paved streets become excessively heated in summer. Vegetation of all kinds exhales large volumes of vapor into the air, which acts efficiently as an equalizing agent of cold and heat, of moisture and drought.

Trees arrest the spread of that gaseous agent, supposed to be the true cause of malarial fever. A grove between a marsh and a habitation protects its inmates from its dangerous malaria. "It has been conjectured," says Dr. Drake, "that their leaves absorb the noxious exhalation."

Trees are of the highest sanitary importance. Their leaves and young twigs imbibe deleterious gases—carbonic acid, ammoniacal compounds, and poisonous putrefactions—and return to the air oxygen, an element essential to the growth and nutrition of animal life.

The public health would be benefitted by their extensive cultivation. They should ornament the edge of every side-walk in the city, while the very broad streets and avenues should have a row of large trees in their center.

Instances are numerous where a lack of proper appreciation of the sanitary value of trees has wrought great harm.

Of public parks, Nashville has as yet but one, and that pre-

sented by a public-spirited citizen, Samuel Watkins, in honor of whom it is named. It is a handsome bit of ground, ten acres in area, west of the city proper. The revolutionary municipal government which came into power October, 1867, made a contract for a tract of land, 46½ acres, mostly outside the northern limit. It is known as the City Park, and cost the corporation $75,700 on July 1, 1877.

There is a public property, 20⅝ acres in extent, quite surrounded by dwellings, railroad shops, and mills, which ought to be converted into a beautiful Monumental Park;—it is now known as the City Cemetery. By sanitary usages at least as old as the days of Abraham, who bought the cave of Machpelah in a field that he might bury his dead out of his sight, this as a cemetery should have been closed long since. In all civilized countries intramural interments are strictly forbidden by law. The long-suffering good nature of the many citizens who, with their families, dwell around this burying ground is wonderful.

Dr. Richard Owen Currey, one of our earliest workers in mortality registration, a scientist, physician and philanthropist of high merit, published in The Southern Journal of the Medical and Physical Sciences, vols. 1 and 2, 1853–4, a series of valuable articles on the Medical Topography and Mortuary Statistics of Nashville, from 1822 to 1853. From these, and from records kept by the sexton, the following summary is made up, showing that from 1822 to 1876 inclusive more than twenty-one thousand interments have occurred. Surely this statement alone ought to compel what has so often been urged upon our city legislature by private memorials and the public press, to-wit, the abandonment of this use for these grounds. With very little expense it may be converted ito a "Memorial" worthy of departed merit. It is well situated, and has noble trees and beautiful walks:

RECORD OF BURIALS IN CITY CEMETERY.

1822	69	1842	212	1860	573
1823	74	1843	265	1861	451
1824	102	1844	314	1862†	627
1825	71	1845	238	1863	837
1826	105	1846	368	1864	1373
1827	129	1847	476	1865	1365
1828	166	1848	446	1866	1369
1829	208	1849	739	1867	541
1832*	115	1850	838	1868	443
1833	355	1851	386	1869‡	211
1834	175	1852	548	1870	312
1835	336	1853	429	1871	285
1836	225	1854	598	1872	289
1837	198	1855	474	1873	568
1838	185	1856	427	1874	339
1839	200	1857	401	1875	159
1840	221	1858	414	1876	148
1841	268	1859	483		
Total					21,148

SYSTEMATIC INSPECTION.

Keep the city clean, keep the city dry. Let the people have plenty of pure water to drink, and forbid the use of poisoned water. Prevent tbe overcrowding of the people, and thus give them pure air. These are the four great principles of public hygiene. To carry these into efficient practice, it will not do to depend upon private and voluntary action. Until the people become better educated on these topics, it is indispensable that thorough and regular inspections, from house to house be kept up, this very system may in due time educate the public so fully as to be in part at least dispensed with. It is a famous axiom that vigilance is the price of liberty. It is equally the price of muscular strength, intellectual culture, moral fortitude. Let the individual relax daily attention to any of these points and he soon is conscious of retrogression. It is all nonsense to attempt excellence in any line or department without the exercise of constant effort.

*There is no official record for the years 1830 and 1831, nor till May, 1832, and the last named year only contains eight months.

†Federal army occupation for four years.

‡Negro sexton, and numbers were buried by others than the sexton.

In 1871, when the Board of Health in Mobile was organized, with Dr. Jerome Cochran, an eminent graduate of the University of Nashville, as Health Officer, the first step was to institute a rigid house to house inspection. The yellow fever which, in the autumn of 1871, desolated other and neighboring places, passed by Mobile. For sanitary science bars out this as well as other dread scourges. Political changes led to the destruction of the Board. In 1873, the old plague returned. When the Board was re-organized in 1875, the first step again was rigid inspection.

In Pittsburg the city is divided into districts, and the work of inspection carried out most fully. See Report, 1875, pp, 11, 12, by Dr. Crosby Gray, Health Officer.

The aim of the Board for several years past has been to ascertain what was the best system that could be adopted in furthering the end contemplated in their appointment. The plan adopted as being most likely to accomplish the purpose, was that of the appointment of a corps of competent sanitary inspectors, whose duty it should be to make frequent and careful inspections of their respective districts, note the causes likely to produce or promote disease, and either take the necessary measures for their removal at once, or report the same to this office and Board. Such a system has been in practice in many other cities, and, as here, has been found to be attended with she most desirable results. There can be no doubt but that this is the proper plan to pursue, provided the persons selected to fill the positions are thoroughly competent, and in this particular your selections have, for the most part, been good. In order to make this branch of the service still more efficient, in addition to the duties of the inspectors, as prescribed in the general law. the following rules and regulations for their government were adopted during the early part of the year.

1st. The Sanitary Inspectors shall, unless otherwise specified at the time of their election, serve for the term of one year, and at such rate of compensation as shall have been, at the time of their election, agreed upon by the Board; and they shall be discharged or suspended only for incompetence or negligence of duty.

2d. The hours of service of the said Inspectors shall ordinarily be from eight o'clock in the morning until six in the evening every day in each week, Sunday excepted.

3d. That as the exigences of circumstances may require, the Board claim the right, without extra compensation, to employ the whole time of said Inspectors from morning until evening, or from midnight until noon, as the Health Officer may direct, allowing such reasonable time as may be necessary for meals or refreshments; and this rule may be continued in force from day to day throughout the entire period for which said Inspectors may be employed.

4th. The Health Officer, at the discretion of the Board, shall designate the

particular districts and the boundaries thereof in which the several Inspectors shall serve.

5th. The duties of the Inspectors shall be to traverse frequently their respective districts, and carefully to note the peculiarities of topography, population, character of occupations or business conducted therein; and of the construction and condition of public buildings, with regard to their sanitary state, or of private dwellings, tenement houses, shops, factories, stables, slaughter-houses. privies, or other buildings; also the condition of street or sidewalk pavements, and street gutters, and manner of drainage or sewerage.

6th. The Inspectors shall promptly report to the Health Officer any nuisance or cause of nuisance found to exist on any street, alley, lane, highway, wharf, dock, or vacant place, or upon any lot, yard, or grounds, or within any stable, shop, factory, slaughter-house, or other building whatsoever. Any offensive or putrefying substance, any offal or refuse material, kitchen garbage, stable manure, or any manner of filth, noisome to the community or detrimental to the public health, which may have been cast out, or permitted to accumulate and remain; any cesspool, over-full or leaking, stable or slaughter-house ill-kept, or sewer connection defective, or drainage imperfect, or tenement houses unfit for occupation or over-crowded, cellars or basements damp or foul, or any instance deserving of attention, of any defect in any building whatever, as regards light, heat and cleanliness.

7th. The Inspectors shall, without delay, report any and all such information as may be herein enumerated and required, together with the name or names of the occupant or occupants, or of the owner or owners of the ground or buildings upon which any such nuisance may have been found; also, the Inspectors shall from time to time perform such other and additional duties as the Health Officer, at the option of the Board, may prescribe.

8th. The inspectors shall annually, or at the close of each term, report each and individually to the Health Officer, and by him to be submitted to the Board, a summary of all the work done during his and their term of service, pointing out all faults in matters of general character, or local deficiences, and applying hints, suggestions, or recommendations in regard to the remedying or rectifying thereof.

The Health Officer of New Haven, Professor C. A. Lindsley, M. D., in Report for 1876, shows the folly of attempting sanitary reform without continuous inspection.

Several years ago the authorities, impelled by a profound apprehension of an epidemic of cholera, appointed a number of Sanitary Inspectors to visit all parts of the city, with authority to order the abatement of all filth nuisances. The effect was most salutary, and the amount of good work accomplished by the Inspectors would have justified an occasional repetition of it. but no general systematic inspection of the city has since been attempted. We have, of ccurse, numerous municipal laws to govern the habits and practices of the people respecting cleanliness in and about their homes. But except when some gross violation of law provokes a complaint from some suffering neighbor, these *laws are not* enforced; and there are many groups of houses, even whole streets

and considerabble sections of the city, where general slovenliness respecting the removal of refuse matter is the prevailing local habit. In these places, within and about each house, and in open yards, common to many houses, the putrefiable refuse of housekeeping is permitted to lie indefinitely, undergoing fetid decomposition.

Those who live in this way are as ignorant of the city laws as they are of the laws of hygiene, or of the risks they incur by exposure to their unsanitarv surroundings. The remedy, in part at least, is obvious. Clean up these filthy places, remove these foul accumulations, cleanse the city of its filth wherever it is found, and the death record will not be so unequally distributed, but will be everywhere sensibly diminished.

Dr. J. G. Cabell, president of Richmond Board of Health, says:

We consider frequent visits to the premises of citizens the most important and necessary part of their duty, and one from which the most beneficial results may be certainly expected.

Report, 1876, p 13.

Dr. W. P. Reese, the learned and zealous Sanitary Superintendent of Selma, makes a good point, very truthful in Nashville. See Report for 1876, p. 10.

While it is true that what we term sanitary policing is more important in what we call "the heated term"—from May to November—it is a very grave error to suppose that filth can be tolerated the balance of the year. Fermentation and the elimination of mephitic gases will take place whenever the temperature is above 75°, not so rapidly as when higher, but enough to produce disease. So that it is safe to say, *inspections cannot be too frequent or too scrutinizing*, from house to house, *and from year to year—from January to January.*

The Philadelphia Report, 1875, sums up this topic in pointed language, worthy the ancient medical Mecca of America:

A great improvement in the sanitary administration of Philadelphia would be brought about if the city were divided into sanitary districts, each under the special care of a properly qualified medical inspector, whose duty it would be to make himself familiar, by frequent surveys, with the topography of the district, the streets, alleys, dwellings, and drainage; the kinds of trades and manufacturing establishments conducted, and the social and physical status of the inhabitants; in fact, with everything pertaining to the sanitary condition of the locality, so that all defects might be pointed out, and the remedies intelligently applied. Such knowledge would be most advantageous in the investigation of the causes of disease, and in preventing and combatting epidemic outbreaks. A thoroughly efficient administration of a health department must be inquisitive and searching. It is not sufficient to depend upon the voluntary information of citizens for knowledge of the existence of a nuisance, though citizens can be of a great service in this way. Incessant and searching systematic inspection is

necessary to accomplish satisfactory results. The health officials should be masters of the situation. They should be argus-eyed, always on the alert, in order to prevent the growth of evils which would otherwise only be brought to their notice after they had obtained considerable magnitude, and become vastly more unmanageable than at their inception. Modern State Medicine is *preventive* medicine, and though its administration may appear to some to be costly because they do not see the evils which have been averted, made up as they are of disease, suffering, death, and cost of treasure; to those of better judgment, who have made the subject a careful study, it is known to be true economy, a saving in the end of a vast amount of money, not to speak of the prevention of suffering and loss of life, which are the best of its results. This conclusion is founded upon experience, and cannot be gainsaid. The improvement above suggested in regard to systematic medical inspection, we deem of great importance, but it will involve additional expense. In view of what has just been said, however, such expense must appear reasonable and necessary, and cannot properly be objected to.

During the last year much attention has been given to this work by the Nashville Board of Health. Sergeant B. M. Hawkins and officer Martin Kerrigan, veterans on the police force, and having much previous experience in sanitary and census work, have been detailed as Sanitary Inspectors. Thorough and systematic tours of the entire city have been made. All nuisances not abated on verbal notice have been speedily followed up with proper orders. These have generally been regarded. In very few instances, indeed, has it been necessary to cite parties before the Recorder. Many expensive private improvements have been made in consequence, and also great interest and corresponding liberality in public improvements, as in the case of the tenth ward drain and the blind school sewer.

The Act of Assembly passed in March, 1877, extending the limits of jurisdiction of Boards of Health one mile beyond city limits, and to which the city ordinance of August 11, 1877, gives validity, will very much increase the labors of the Health Officer, and more especially those of the Sanitary Inspectors. The additional territory to be overlooked is quite five thousand acres, being more than twice the area of the city proper. As a sanitary measure, this extension of jurisdiction is an important advance.

The last tour of inspection was very minute, and much information collected of permanent value. It is contained in four manuscript volumes, arranged by wards and streets, so as to be readily consulted. These volumes contain a census and a "dic-

tionary of habitations." Each house, dwelling or otherwise, is described, name of occupant given, and all points of interest connected with census or habitation duly entered. The distinction of races, Caucasian and African, is maintained throughout. All this registration has been very carefully made. The results are here given in condensed tabulated form. It is due the Inspectors to state that they have taken an honest, scientific pride in the work, fully understanding its scope and bearings. Their figures may be relied upon.

INSPECTION OF FOOD.

In examining the reports of the different health departments, we find great attention paid this subject. Nearly every city has one or several officers, usually under the Board of Health, who give their whole time to the examination of food. Great cities subdivide the work into inspection of meat, of milk, of fish, of vegetables, and so on. Smaller cities appropriately combine these in one. Most of the city reports give annual exhibits of the amount of food of various kinds condemned.

The Nashville Board has called, in a special manner, the notice of the City Council to the great importance of systematic inspection of food, more particularly of meat. Hitherto without effect. Yet the suggestions of the Board may be effectually carried out at no increased expense, simply by re-arranging the duties pertaining to the offices of Marshal and Assistant Marshal.

In "The American" of August 4, 1877, it is stated that hogs are dying in every part of Lawrence county of cholera and measles. Also that in some parts of Bedford county a disease has attacked milk cows which proves fatal in a short time. "The Southern Poultry Journal" for August, 1877, speaks of the severe losses sustained every year by the breeders of the south and southwest from cholera among their fowls. Such facts show how great is the danger of city people being supplied with diseased animal food. The frequent condemnation of vegetables and other articles by Assistant Marshal Willard, shows that Nashville is not exempt from this common danger.

As bearing upon and intimately connected with meat inspection, the propriety of establishing a first-class abattoir in or near Nashville, should be urged upon our enterprising citizens now

engaged in the occupations of butchers or pork packers. The meat trade of the United States is fast assuming large proportions. Nashville should have a handsome share in this trade. There are sites admirably adapted for the purposes of an abattoir, now to be had for a very low price. By thus gradually concentrating the slaughtering business, one of the most attractive districts of the city would also be relieved from nuisances which threaten seriously and permanently to impair its health and growth.

Dr. C. C. Cox, President of the District of Columbia Board of Health, says, in Report for 1875, p. 17:

In most of the principal cities slaughtering within the corporate limits has been prohibited, and abattoirs established. Prominent among these are the establishments at Boston, Jersey City, and New Orleans. It cannot be doubted that slaughter houses located in populous cities or districts, however carefully treated, become not only offensive to residents, but open to serious sanitary objections. The killing of animals, boiling of bones, rendering of fats, and the utilization of blood and offals, should be conducted in one establishment or a series of buildings grouped together at some point removed from population, with every appliance for cleanliness and dispatch, possessing an abundant supply of running water, and easy and rapid facilites for transportation to market. The strictest hygienic requirements should be enforced, the entire arrangement being submitted to and conducted under the direction of a well-regulated Board of Health. Nothing short of this can effect exemption from a fearful nuisance, and secure to the consumer sound meats properly slaughtered.

Dr. E. H. Kelly, Health officer in Cleveland, Report 1875, p. 23, applies the argument to that city:

As slaughtering is conducted in this city, the people have no protection but the conscience of the butcher against the danger arising from the sale and use of unwholesome or diseased meats. The flesh of calves, pigs, etc., which was much under the age of one month when killed, has been sold in this city, and other meats have been put upon the market that were affected with trichinnæ, etc. To prevent the exposure of such meats in the market, a thorough system of inspection, both before and after killing, should be inaugurated.

In the present situation of affairs this is an impossibility. Widely scattered as are the slaughter houses, the cost of thorough inspection of animals before killing would be considered perhaps too great a burden on a heavily taxed city, although the benefit received might be great. To obviate this objection, there might be established an abattoir, when the expense of inspection would be comparatively small. The Brighton abattoir has been in successful operation since 1873, and in it are killed nearly two-thirds of all the animals used in Boston. This was established on account of the energetic action of the Board of Health the State of Massachusetts. The stench from the Brighton slaughter houses,

with a favorable wind, would penetrate to the center of the city of Boston, and the meat furnished the citizens was often diseased and unfit for consumption. Dead unslaughtered animals, those feverish and bruised by the long car ride from the West, and exhausted by hunger, thirst, and heat, were dressed and served to the unsuspecting public.

The death of a butcher, poisoned by the flesh of a diseased animal, caused an investigation respecting the character of meat furnished Boston markets, and enabled the State Board of Health to perfect and carry out their plans, and secure the erection of an abattoir. It is entirely a private matter, built at private cost, sustained by its profits, and with its sanitary arrangements under control of the State Board of Health. All waste is utillized on the premises before fermentation takes place, and makes a return in money where, under the old single system, it was a total loss. By adopting a system similar to that in Boston, offensive odors can be prevented and money saved on waste. The business of slaughtering more economically conducted, citizens insured a better grade, cheaper and more wholesome meats, and perfect cleanliness in their preparation.

In the St. Louis Report of Dr. W. L. Barrett, 1876, p. 40, the people are urged to act upon this subject:

The time has come when St. Louis should no longer tolerate slaughter-houses within her corporate limits, nor within the jurisdiction of the Health Board. A due regard for the comfort, health and pecuniary interest of her citizens, no less than a laudable desire to keep pace with the restless advancement of the age, prompts to this action, and are sufficient arguments why these noxious establishments should be transferred from the cramped and crowded streets of the city to more appropriate places. The experience of other cities is an ample guarantee that this change would be no less a benefit to the community at large than to the butchers themselves. Among this latter class, there is a strong prejudice against any variation from the old custom, but this is natural, and we feel convinced it is the results of an imperfect understanding of the Abattoir system, and a reluctance to discard familiar customs. We are satisfied that a thorough investigation on the part of butchers would persuade the more intelligent that their interests would be vastly subserved by an abolition of the system now in vogue. New York, Boston, New Orleans and Philadelphia, all have abattoirs in successful and satisfactory operation. Certainly the only sanitary plan is to concentrate all branches of the business, from the reception of the cattle to the delivery of the meat, on one hand, and on the other, the utilization of the tallow, the hoofs, hides, bones, horns, and such other parts of the animal as are not used for food, while they are still fresh and inoffensive. This should be done in an eligible location, on an extensive scale, and by the most approved process.

The Milwaukee Report, 1875, p. 59, congratulates the people of that healthiest of cities:

Propositions have been made by two trustworthy and responsible citizens to erect, fit up, and maintain, under the control of the Board of Health, abattoirs to meet in every way the requirements of Milwaukee. They ask no bonus of

aid from the city, but merely to prohibit slaughtering in connection with the private residences or shops of butchers. We trust that in the next annual report issued by the Health Officer the citizens of Milwaukee will be congratulated that this great sanitary measure, the erection of public abattoirs, has been finally effected.

Dr. T. H. Kearney, Health Officer, in Cincinnati Report, 1876, p. 41, sums up the advantages of abattoirs:

These advantages, briefly, are the concentration of the business of many small concerns in one, where all the conveniences needed can be provided at a much less cost than by the present system of many separate slaughter-houses; the release of much property for other purposes, should the many small establishments be given up; the utilization in the abattoir through the use of improved machinery, etc., of much that is now wasted, and before that material becomes offensive; and particularly, from a sanitary point of view, the removal from among the habitations of the citizens of many small and badly managed slaughtering establishments, which are unmitigated nuisances; and the avoidance of the annoyance from the transport of offal through the city, which has been, and still is, the subject of much complaint.

INSPECTION OF SCHOOLS.

Under the cross-fire kept up so vigorously during the present generation by parties opposed to the public school system of America, either because they wished to abolish that system outright, or else desired to have exclusive control, it has been compelled to look mainly at one element of education, the intellectual. Thus it happens that the three other essential elements of a harmoniously rounded and practically complete training are almost or altogether overlooked. The religious and moral, which are one, is thrust aside, while the æsthetic and the physical are quietly ignored. The friends and outspoken advocates of human progress through the education of the masses, are well aware of and greatly deplore this unfortunate position of the public school system. From the sparkling, lively, thoughtful weekly, the *New England Journal of Education*, to the stout quarterly, Henry Bernard's *American Journal of Education*, recognized as the leading periodical of its kind in the English language, all the journals, as well as the numerous State and city reports, show that none better than teachers understand this whole question, and that they at least need no ill natured criticisms or carping admonitions. The difficulties and defects are inseparable from the infancy of American society and institutions. Time, thought,

patience and prudence will gradually improve and perfect the system of popular education, which is the peculiar outgrowth of America, and is now spreading over the world.

The first defect to be remedied will doubtless be the physical. Upon this there will be less difference of opinion. To this the public attention has been directed for more than thirty years by the medical journals, and now that the experience of successive school generations is giving point to these timely warnings, the great profession is urging sanitary reform in the school house, public and private. Nashville, which, before and since the civil war, has been signally distinguished as a focal point for public schools, should not be content to follow other cities, but should take the lead in putting health into the school-room. Among her corps of public teachers the "School Inspector and Lecturer on Hygiene" should rank second only to the Superintendent. He should be a thoroughly trained physician, endowed with aptness to teach, and with his time and penalties so exclusively devoted to the functions of his office as to enable him to make an impress upon the whole corps of teachers and pupils. It will be safe to maintain that at least ten per cent. would be added to the efficiency of any city public school system by adopting this plan. In Nashville it would be a clear gain of $6,000 per annum.

The obligations resting upon the medical profession is well argued by Dr. Hugh W. Brock, in a report on "the hygiene of the school-room and its surroundings," to be found in the Transactions of the Medical Society of the State of West Virginia, 1877, p. 258:

> While it is true that the charlatan alone volunteers his advice and services to the individual sufferer, it should also be held as true, that upon all questions affecting the public health, or the health of any particular community within the sphere of our influence, we should have the right to speak and to urge, by the presentation of facts and arguments, the soundness and importance of our views.
>
> It should be held by ourselves, as well as by all good citizens, that it is our province, when called upon, not only to use our best knowledge and skill for the relief of suffering and the cure of disease, but also for their prevention. We should esteem ourselves, and should be esteemed by the public, as, in a great degree, the guardians of the public, and in the exercise of this function, we should not always wait to be consulted, but we should often, in a certain sense, be aggressive, and even obtrusive, in the expression of our convictions.
>
> It is to be feared that the modesty characteristic of all worthy medical men,

has often led to too great a degree of reticence upon these questions, and the public health and the public interests have thereby suffered.

The First Report of the Georgia State Board, 1875, has a paper "on the Hygiene of Schools," by C. B. Nottingham, M. D., which should be very widely distributed by School Boards to teachers in their employ.

The importance of elementary physiology in the schools may be stated in the words of an eminent scientist and educator well known in Nashville. In *The American* of August 4, 1877, Professor Huxley's most recent lecture is given. He says:

Sufficient knowledge has now been acquired of vital phenomena to justify the assertion that the notion that there is anything exceptional about these phenomena receives not a particle of support from any known fact. On the contrary, there is a vast and an increasing mass of evidence that life and death, health and disease, are as much parts of the ordinary stream of events as the rising and setting of the sun, or the changas of the moon, and that the living body is a mechanism, the proper working of which we term health. Its disturbance, disease; its stoppage death. The activity of this mechanism is dependent upon many and complicated conditions, some of which are hopelessly beyond our control, while others are capable of being indefinitely modified by our own actions. The business of the hygienist and of the physician is to know the range of these modifiable conditions, and how to influence them towards the maintenance of health and the prolongation of life; the business of the general public is to give an intelligent assent and a ready obedience based upon that assent to the rules laid down for their guidance by such experts. But an intelligent assent is an assent based upon knowledge, and the knowledge which is here in question means an acquaintance with the elements of physiology.

ON THE DIRECT PREVENTION OF DISEASE.

The measures heretofore discussed in a brief and fragmentary way, may be styled the indirect prevention of disease, since they remove predisposing causes, excitants and aggravations. There is another grand department of State Medicine which undertakes directly the prevention, or stamping out, of disease. Some of the greatest, and the most beneficent, applications of science occur in this field. And all these would be impracticable but for the principle which underlies all Public Hygiene, that individual ignorance, obstinacy and lethargy must yield precedence to the general welfare.

SMALL-POX.

The vast results flowing from Jenner's long and patiently pursued discovery, have for a generation passed from the narrow field of medicine to the wider domain of general history. The world at large now ranks him with Watt and Franklin, and a few other select men, among the greatest benefactors of mankind. With theirs his name is used to point a moral and adorn a tale, when the triumphs of science are eulogized, or the glories of philanthropy portrayed.

That small-pox still so often prevails as an epidemic, causing much alarm, loss of life, and loss in business, must be attributed to the fact that governmental authorities do not give heed to medicine warnings. In 1872 every seaport city in the country and many of the interior cities and towns were attacked, more or less severely, by epidemic small-pox. Mobile, with a responsible Board of Health, was saved from a visitation. In 1874 it was severely scourged, the Board having been abolished. In our great cities there can be no doubt that but for the powers entrusted to Boards of Health, small-pox would soon resume its ancient position as one of the chief ills to which flesh is heir.

During the last three or four years small-pox has been virulent in neighboring cities all around us. That Nashville has been SO ENTIRELY CLEAR of it, must be attributed to the timely action of its Health authorities. As an instance of their mode of working, and also as a specimen of the vast charity done by the profession to a not very appreciative public, the following from the Minutes of the Board, April 18, 1876, may be cited:

Dr. Plunket introduced the following Resolution, which was unanimously adopted:

Resolved, That the Board of Health, recognize with much gratification the service so generously given in the thorough and very satisfactory vaccination of the indigent, both white and colored, in and around Nashville; and in behalf of those who were the recipients of this charity, do return our most sincere thanks to the following physicians, who thus kindly volunteered their services:

J. A. Draughon,	M. D.	N. G. Tucker,	M. D.
W. W. Gray,	"	C. E. Knott,	"
R. D. Winsett,	"	P. R. Bailey,	"
J. W. McAlister,	"	W. F. Glenn,	"
J. W. Mayfield	"	W. D. Haggard,	"
B. F. Morton,	"	T. R. Kimbrough,	"
J. W. Lightfoot.	"		

During the winter of 1875–6, the total vaccinations amounted to 10,760. Of these, probably 9,000 were gratuitous, being a contribution of several thousand dollars to the public. In most cities this service is performed under public directions for compensation.

SYPHILIS.

There is a pest more blighting in its effects upon the health and vitality of the human species, perhaps, than even variola or cholera. To this the attention of the medical profession and of the general public has been called in a marked manner of late by scientists of all shades, medical and social. Dr. S. D. Gross, in his address as President of the American Medical Association, discusses this subject fully and with great eloquence. Dr. J. Marion Sims, in a similar address, treats it with a profound practical discrimination.

Without legalizing prostitution, a measure abhorrent alike to Christian morality, and to the sentiment of reverence for pure womanhood deeply implanted in the breast of every son, husband and father, a measure placing modern Christian nations upon a level with the ancient effete heathen races, and a measure never anywhere really accomplishing its aim, this increasing and widespread evil may be checked and restrained by the application of the principle now universally applied to cases of all contagious diseases. Just as the individual patient with yellow fever, smallpox, cholera, or scarlet fever, man or woman, young or old, is rigidly watched for, promptly taken in charge, and absolutely segregated from the public, thus preventing the spread of contagion, so it should be with all forms of contagious venereal affections. Here as elsewhere, while the public will be guarded as with a shield, the individual will not suffer. The opportunities for recovery in each case will rather be greatly increased by these measures.

SCARLET FEVER.

This disease has taken a place among the great scourges of the human race. As showing how preventive medicine grapples with such pests, the document sent broadcast throughout Michi*gan is* here given. Scarlet fever is not a stranger in Nashville,

nor in Tennessee, and special attention is called to this valuable epitome. It is doubtless written by Dr. Henry B. Baker, Secretary, who is so high authority as a statistician, and who, in the short period of five years, has achieved national reputation in the field of State medicine:

RESTRICTION AND PREVENTION OF SCARLET FEVER.

(Document Issued by the Michigan State Board of Health.)

Scarlet Fever (sometimes called "Scarlatina," "Scarlet Rash," "Canker Rash," etc.) is now believed to be one of the most contagious diseases. One attack usually prevents subsequent attacks. The greatest number of deaths from this disease are of children under ten years of age. Adult persons do sometimes have the disease. Scarlet Fever is believed to arise from a special contagium or poison which may be conveyed to persons previously unaffected, by personal contact, by infected clothing or paper rags, or by any of the discharges from the body of a person affected with the disease.

The discharges from the throat, nose, and mouth are considered extremely dangerous, but those from the skin, eyes, ears, kidneys and bowels, are also dangerous, and remain so for a considerable time.

Filth, all forms of uncleanness, and neglect of ventilation, increase the danger of spreading the disease.

Communication. It is believed that the disease may be communicated by a person recovering therefrom so long as the usual subsequent scaling or peeling of the skin continues, which sometimes is not completed before the lapse of seventy or eighty days, although usually completed sooner.

The interval of time which may elapse after exposure to the contagium of scarlet fever and during which a susceptible person so exposed may expect to be taken sick with the disease, varies from one to fourteen days.

Separation of the sick from the well. Whenever a child has sore throat and fever, and especially when this is accompanied by a rash on the body, the child should be immediately isolated as completely as possible from other members of the household, and from other persons, until a physician has seen it and determined whether it has scarlet fever. All persons known to be sick with this disease should be promptly and thoroughly isolated from the public.

That this is of more importance than in the case of small-pox is indicated by the fact of the much greater number of cases of sickness and of deaths from scarlet fever,—a disease in which there is no such preventive known as vaccination.

The room into which one sick with this disease is placed should previously be cleared of all needless clothing, carpets, drapery, and other materials likely to harbor the poison of the disease, except such articles as are essential to the well-being of the patient. The sick room may have no carpet, or only pieces which can afterwards be destroyed. Provision should be made for the introduction of a liberal supply of fresh air and the continual change of the air of the room without sensible currents or drafts.

Handkerchiefs, that need to be saved, should not be used by the patient; small pieces of rag should be substituted therefor, and after being once used should be immediately burned.

Soiled bed and body linen should be placed in vessels of water containing chlorinated soda, chlorinated lime, or other disinfectant, before removal from the sick room. For this purpose chlorinated soda is the neatest and most convenient because it can be used with soap, but it is apt to lose its disinfecting properties by age. Chlorinated lime, if used too freely, may destroy articles of clothing with which it comes in contact, but if properly used it is the safest as a disinfectant.

The discharges from the patient should all be received into vessels containing chlorinated lime (commonly called "chloride of lime"), sulphate of iron, or some other known disinfectant (carbolic acid in dilute form as generally used is not believed to be a disinfectant), and the same buried at once, and not by any means be thrown into a run-

ning stream, nor into a cesspool, or water closet, except after having been thoroughly disinfected. All vessels should be kept scrupulously clean and disinfected.

Perfect cleanliness of nurses and attendants should be enjoined and secured. As the hands of nurses of necessity become frequently contaminated by the poison of the disease, a good supply of towels and two basins—one containing solution of chlorinated soda (Labaracque's solution), chlorinated lime or other disinfecting solution, and another for plain soap and water—should be always at hand and freely used.

Persons who are attending upon children or other persons suffering from scarlet fever, and also the members of the patient's family, should not mingle with other people nor permit the entrance of children into their house.

Funerals of those dying from scarlet fever should be strictly private and the corpse not exposed to view. To avoid mistakes, notices of such deaths in the papers should state that the deceased died of scarlet fever.

All persons recovering from scarlet fever should be considered dangerous, and therefore *should not attend school, church, or any public assembly, or use any public conveyance,* so long as any scaling or peeling of the skin, soreness of the eyes or air passages, or symptoms of dropsy remain. No person recovering from scarlet fever should thus endanger the public health, nor appear in public until after having taken four times, at intervals of two days, a thorough bath. This cleansing, however, should be deferred until the physician in charge considers it prudent. After recovery from scarlet fever, no person should appear in public wearing the same clothing worn while sick with or recovering from this disease, except such clothing has been thoroughly disinfected by some such method as herein specified.

Gaseous disinfection, or fumigation, can only be completely and entirely effectual in the absence of living persons, as fumes strong enough for the purpose are destructive of human life. This need not deter from doing so much as is possible, without injury to sick persons, for the purification of the air of rooms occupied by them,—a liberal supply of pure air should be secured: but after the sick have recovered, the room, furniture, and other contents not to be destroyed, should be thoroughly exposed for several hours to strong fumes of chlorine gas, or to fumigation by burning sulphur; or the paper on the walls, if any, removed and burnt, the furniture scrubbed or polished, and the room thoroughly scrubbed and whitewashed.

When a room and contents are to be disinfected, all articles therein should be spread out so as to expose the greatest amount of surface to the action of the disinfectant, and all openings to the room should be closed.

To generate chlorine, take peroxide of manganese (to be obtained at any drug store), place in an earthen dish and add one pound of hydrochloric acid (sometimes called muriatic acid), to each four ounces of the peroxide of manganese. Care should be taken not to inhale the gas. After being certain that continuous evolution of chlorine has been secured, leave the room and close the door of exit.

The bleaching properties of chlorine may destroy the color of colored goods exposed to it, but as a disinfectant it is one of the best.

To generate sulphurous acid gas, put live coals on top of ashes in a metallic pan, and place on the coals sulphur in powder or fragments. A convenient way is to place the coals and sulphur on a heated stove-plate or cover turned bottom upward in a pan half filled with ashes. To disinfect 100 cubic feet of air requires the thorough combustion of about 1¼ ounces of sulphur.

Rooms should be kept closed and subjected to the action of the disinfecting gas for six or eight hours, and afterwards thoroughly aired by opening doors and windows.

Heat as a disinfectant. It is believed that heat sufficient to be disinfectant for this disease may be secured without destroying ordinary articles of clothing, say at 240° to 250 F.

In cities and villages it may be practicable for the local boards of health to provide a central disinfecting oven or room where a large amount of material may be carried, in a closed conveyance, from houses where the disease has prevailed, and, after disinfection by heat under the direction of some competent officer of the board, returned in another *conveyance* to the owners. For certain articles, this may well supplement the gaseous

disinfection at private houses, which cannot in every case be conveniently and thoroughly applied to all articles.

Whenever a case of this disease occurs in a locality, prompt and vigorous action should be taken for the restriction of the disease, by early isolation of those sick with the disease, and by the destruction or disinfection of all articles likely to be infected.

Plain and distinct notices should be placed upon the premises or house in which there is a person sick with scarlet fever, and *no child that has not had the disease should be allowed to enter*, or to associate with persons who do enter such house or room.

Householders, Physicians, and Boards of Health have duties to the public, some of which are specified in sections 1734, 1735, 1732, and 1695 of the Compiled Laws of Michigan, 1871, as follows:

"(1734.) SEC. 43. Whenever any *householder* shall know that any person within his family is taken sick with the small-pox, *or any other disease dangerous to the public health*, he shall immediately *give notice thereof to the Board of Health*, or to the *health officer* of the township in which he resides; and if he shall refuse or neglect to give such notice, he shall forfeit a sum not exceeding one hundred dollars."

"(1735.) SEC. 44. Whenever any *physician* shall know that any person whom he is called to visit is infected with the small-pox, *or any other disease dangerous to the public health*, such physician shall immediately *give notice* thereof to the Board of Health or health officer of the township in which such diseased person may be; and every physician who shall refuse or neglect to give such notice, shall forfeit, for each offense, a sum not less than fifty nor more than one hundred dollars."

"(1732.) SEC. 41. When the small-pox, *or any other disease dangerous to the public health*, is found to exist in any township, *the Board of Health shall use all possible care to prevent the spreading of the infection*, and to *give public notice of infected places* to travelers, by such means as in their judgment shall be most effectual for the common safety."

(1695.) SEC. 4. The said Board shall also make such regulations as they may deem necessary for the public health and safety, respecting any *articles which are capable of containing or conveying any infection or contagion, or of creating any sickness*, when such articles shall be brought into or conveyed from their township, or into or from any vessel; and if any person shall violate any such regulation, he shall forfeit a sum not exceeding one hundred dollars."

The prompt and efficient action of local Boards of Health relative to infected clothing and other articles is further specified in sections 1710, 1711, and 1713, Compiled Laws of Michigan, 1871.

The general laws of this State provide that the mayor and aldermen of cities, and the president and council of trustees of villages, "Shall have and exercise all the powers, and perform all the duties, of a Board of Health as provided in this chapter." This is in chapter 46, sec. (1740) 49, Compiled Laws of 1871, from which chapter all of the foregoing sections are taken. See also in Laws of Mich., 1873, the general act for the incorporation of cities, chapter XIV., secs. 1, 7 and 8.

It therefore appears that, except possibly some special charter may exempt a city or village, the foregoing provisions of law are probably applicable and in force in the cities and villages, as well as in all the townships, throughout the State.

The local Board of Health and the physician in charge of cases of this disease should co-operate for its restriction. The local Board of Health should particularly guard against its spread by cases where no intelligent physician is employed.

All clothing, carpets, curtains, furniture, and other substances that are to be destroyed, should be dealt with in a way to avoid conveying the poison to any person in the process; they should not be simply thrown away, or into some stream or body of water; and if burned, should be completely burned, and not simply heated or dealt with in a way to diffuse the poison of the disease.

All such infected substances which are not destroyed, should be thoroughly boiled, subjected to a dry heat of 250° F. in a closed room or disinfecting oven, or be thoroughly exposed to fumes of chlorine or of burning sulphur. Books and furs that have been used or handled by those convalescing from this disease are particularly liable to convey the poison to children who have never had the disease. Great care should be used to thoroughly disinfect any such articles that are not destroyed; and caution should

be exercised before allowing children who have not had scarlet fever to handle any such articles that have been used by persons liable to communicate the disease.

Fresh Air. Although not so active for the destruction of the contagium as is chlorine or sulphurous acid gas, pure air, in liberal amount, is a very useful and important agent for the dilution and destruction of the poison of the disease; it should be employed freely; but with this as with other procedures for the safety of the unaffected, great care should be taken not to increase the danger to those already sick from any cause, who are usually endangered by exposure to drafts of cold air, and this is especially true of persons convalescing from Scarlet Fever.

With the view of lessening the number of cases of and deaths from Scarlet Fever in Michigan, the foregoing is published by the State Board of Health for distribution throughout the State. Physicians being to some extent the custodians, and as a matter of fact, effective conservators of the public health, copies of this document are also sent to the physicians in Michigan, in the hope and with the expectation that they will aid in diffusing among the people such knowledge of the nature of Scarlet Fever as will enable the people better to co-operate with them and with Boards of Health for the restriction of the disease and a decrease of sickness and deaths therefrom.

LANSING, MICH., April, 1877.

When every State in the Union has a Board of Health such as that of Michigan, and when similar pains are taken to enlighten the public as to duty in respect of epidemics and contagious diseases, great strides will have been made towards that high civilization which should characterize an intelligent republic.

ATTENTION TO THE SICK POOR.

Since the days of the great scholar and saint, Jerome, under whose influence the first hospital was established about A. D. 400, the comfort and well-being of the sick and helpless has been a leading care of the Christian Church. From the Church this sentiment and practice has passed into the State. Thus to-day it gives origin to one of the great departments of State Medicine, administered through dispensaries, hospitals, and attending upon the poor in their homes.

DISPENSARY.

The City Dispensary was established in 1867. It is kept open from 8 A. M. to 9 P. M. It is located on the corner of Cherry and Deaderick streets, in the rooms of the Board of Health. The Dispensary is well stocked with drugs, medicines, and chemicals. The salary of the keeper is $500 per annum, which is very small compensation for the amount of labor that he has to perform, and the responsibility of the position. It is intended for the poor alone, who receive their medicines gratuitously upon the simple endorsement by the attending physician of the word

"charity," upon the prescription paper. The physician has the entire responsibility of determining whether the city should or should not bestow this charity. Thus there are in Nashville some sixty almoners of this public bounty. Without great vigilance on the part of the prescriptionist having charge of the Dispensary, there is constant liability to impositions of various kinds.

From Mr. Frank Sieferle, the experienced and watchful custodian and prescriptionist, the following information is obtained. It gives a very good idea of the scope and beneficence of a Dispensary. Mr. Sieferle states that about equal numbers of white and colored persons are supplied, which, in proportion to population, gives the latter much the larger share.

PRESCRIPTIONS FILLED, 1875.

January	381	July	474
February	373	August	662
March	524	September	515
April	491	October	550
May	465	November	421
June	447	December	350
Total			5,653

Drugs, Printing, Coal, Sundries	$954 39
Salary of Clerk	500 00
Total expenses	$1,454 39

PRESCRIPTIONS FILLED, 1876.

January	458	July	458
February	458	August	618
March	571	September	628
April	645	October	632
May	562	November	488
June	574	December	408
Total			6,500

Drugs, Printing, Coal, Sundries	$1,268 97
Salary of Clerk	500 00
Total expenses	$1,768 97

Under our system, which constitutes all physicians almoners of this public charity, there is doubtless some uncalled for ex-

penditure, far more so than if the charity prescribing was mainly by district physicians under supervision. The Cincinnati Report, 1876, p. 13, shows the necessity of vigilance under any system.

In former years this (medicine for the indigent sick) has been a very heavy cost, averaging for each of the five years next preceding the last no less than $10,649. Indeed, it is open to question whether the very considerable sums expended for medicines represent any commensurate benefit to the recipient of this relief. There is always danger of liberality in this matter degenerating into prodigality, which is one of the greatest faults in the existing system. For it is difficult to apply any efficient check on the tendency, on the part of some individuals, to extravagance or needless use of medicine. It is highly probable that many of those on the lists of "Indigent Sick" are taking more or less medicine from whim, or for no better reason than because they get it for nothing. The District Physicians have been particularly instructed to use care and judgment in ordering medicine, and not to prescribe it merely to gratify the wishes or fancies of individuals who might imagine themselves in need of it; while, at the same time, no one really sick should be denied medicine that might be deemed actually necessary.

HOSPITAL.

Many persons, strangers and the very destitute, need not only medicines and medical attendance, but also food and shelter. These must be taken care of in hospitals. Nashville is, perhaps, the only city of its size in Christendom without a public charity of this kind. All other cities, especially those which are centers of medical education, have great establishments belonging to the public, endowed either by municipal or private liberality, or by both. These are in every possible way made subservient to medical teaching, being about the only contribution made by public or private liberality to the education of the great class of doctors, upon whom the said public so loudly call for relief when *in extremis* It is indeed strange that in a city of so much wealth and enterprise, the only hospital it has should be the property of its ancient University, erected out of the tuition fees of the joint Faculty of the Nashville and Vanderbilt Universities. Drs. A. A. East and M. Baxter, Superintendents of this institution, which is open to all who are paid for, whether sent by City, County, State, United States, or private parties, for all these are there, have made out the appended statement. It shows that *de facto*, ample provision is made for the sick poor of Nashville who are sent thither through the Health Officer and Mayor.

Here it must be pointedly remarked that, maugre all possible

vigilance on the part of these functionaries, the little city is subject to much imposition and undue expense. Surrounded by at least fifteen thousand people contiguous to its limits, a railroad center, and county seat of a populous county, it is taxed with a large charity list, which should be borne by county or State Governments. No vigilance can prevent this. The greatest care and time has been devoted to this matter by both Health Officer and Mayor during the past year, in accordance with existing law. These laws cannot be improved. The defect is in the surroundings. Take one case as a fair specimen of the many. One of the best informed physicians as to localities in Nashville, a man born and reared here, sent a note to the Health Officer certifying that a poor woman was an old resident, and in every respect entitled to hospital charity. Upon a personal visit, after much cross examination it was ascertained that the applicant was a resident of the county, had been in the city only two weeks, and had taken lodgings with a view to getting into the hospital. If admitted, she would have remained at least two months, at a cost to the city of thirty-six dollars, and medicines. Now, had her friends been as well up to the business as are the many, the ticket of admission would have been granted. They would have readily testified that she was a *bona fide* Nashvillian, and so on, and so on. When it comes to public charity, the private conscience is amazingly elastic. The true remedy for the unequal burden now carried by the few acres of taxed land called Nashville is, that the rich county of Davidson and the great State of Tennessee should do their share and duty.

In other American cities very much has been private charity for the relief of the sick poor. The Roosevelt, Presbyterian, and St Luke's Hospitals, in New York, and the Roper Hospital in Charleston, are examples. In Nashville nothing has yet been done. No individual has been moved by philanthropy and religion to spend his thousands in this channel. Our Duncan Robertsons have thus far been poor men. Our denominations are of course not sufficient in numbers to undertake this work separately. Would it not be well for the whole community to unite, and through one organization administer the help so frequently needed by citizen or stranger? Thus great good could be done in cases which the city cannot reach. Also the city

would then be relieved from many cases which now claim her funds, and run up the charity expenses to an alarming figure. There is an existing organization which has always distributed charitable funds committed to its care with strictest impartiality, and could with safety be entrusted with this duty. Men of all faiths belong to its ranks.

DISTRICT PHYSICIANS.

Alongside the Dispensary and Hospital charities, which relieve so much suffering and misery, must be arranged a department of attention to the sick poor, hitherto strangely overlooked in Nashville, to-wit, medical attendance in their homes. My predecessor, a practitioner of great experience, called my attention to this deficiency upon my first taking charge of the Health Office. He remarked that no one physician could attend to the applications daily made there for medical services, even though a man of great activity, and giving to this work his entire time. The examination of the death certificates for even a single month forces this subject most painfully upon the observer. So many are signed at the Health Office, so many others are signed by physicians who were called in simply for that purpose. The grief and mortality caused in Nashville by the entire destitution of medical aid in a vast number of individual cases is astonishing. We have Hospital, Dispensary, College Clinics, and a profession for devotion and charity not surpassed by any equal number of men in any calling in any part of the world. This I know from experience as Acting Confederate Post Surgeon, at the great crisis in February, 1862; as President of the Robertson Association during the gloom of 1873, and never more fully than during the past year in the varied arduous, and in some respects oppressive, duties of Health Officer. And yet one cause of our unduly high death-rate is want of medical attendance. Every practitioner in Nashville will sustain this statement, though at the same time it is equally true, that fully one-third of the time and care of the medical profession is a donation to the public. This is an evil of the first magnitude, caused mainly by ignorance, and the dense crowding of the African race into the city. It must and can be remedied.

[It is proper here to state, that while the entire profession of Nashville has exercised the utmost liberality in waiting upon charity cases, yet owing to convenience of location, I have had occasion frequently to call upon Drs. N. G. Tucker, R. D. Winsett, W. D. Haggard, A. Morrison, J. W. McAlister, W. Ewing and Professor W. F. Glenn. A number of patients have been treated by these physicians at home, who would otherwise have cost the city quite a sum at the Hospital. In one instance alone it would have been at least fifty-four dollars. But few charity cases apply to the Health Office; most seek the nearest doctor. In my own duties at the Workhouse, Drs. W. J. Sneed, W. R. Lambuth, R. D. Winsett, Wm. G. Ewing, W. D. Haggard, N. G. Tucker, and Professors V. S. Lindsley and Wm. L. Nichol, have rendered occasional but most timely assistance, which is hereby gratefully acknowledged. Professor Wm. T. Briggs and Editor Charles S. Briggs have been exceedingly liberal in allowing ready access to their collection of books and medical journals, the only one of the description in Tennessee. Professors Paul F. Eve and Duncan Eve have been most generous in allowing me to use their valuable library as my own.]

The remedy is the adoption in Nashville of a plan carried out with great advantage in other cities. By this plan Nashville would be divided into at least two districts, each having a resident physician, whose duty it would be to acquaint himself thoroughly with the very poor of his district, and to wait upon them in time. Not being restricted to this work alone the salaries need not be high. The city would more than save the expense incurred by diminished charges in Hospital and Dispensary Departments, as is obvious upon the least reflection. Again, these City Physicians would be most valuable auxiliaries to the Board of Health, in removing gross ignorance precisely where it does most harm. In many aspects, their functions would combine the highest traits of scientific philanthrophy and public utility. The above important suggestions, which ought to be carried into effect without delay, since deaths daily occur because of their lacking, may be fortified by numerous citations. One or two must answer.

The health department of Charleston is an institution far beyond anything of the kind in the State, and it confers great benefits and advantages to the poor of

the city. It consists of six physicians, who, together with the physician supplied by the trustees of the Shirrar's Dispensary, have charge of the indigent sick of the city. The city is divided into seven health districts, and one of the physicians is assigned to each district. Besides his salary, each physician is paid two hundred dollars, from which he is required to provide medicines and stimulants needed by the patients.

A study of the reports of the Health Department of the city of Charleston, demonstrates the necessity of providing institutions for the distribution of public charity in that direction. Such an examination shows that from one-seventh to one-fourth of the entire population of the city receives gratuitous medical attendance.

See Simons' Report, p. 35.

The present system of affording relief to the poor of Cleveland, consists in the appointment of six district physicians at certain salaries, who provide medicines. Health Officer Wells recommends a central Dispensary in lieu of latter feature. See Report 1876, p 137.

In Cincinnati there are twenty-five district physicians, one for each ward.

CARE OF PRISONERS.

Last but not least in the wide range of subjects embraced under the comprehensive term, State Medicines, we come to those who, in misfortune and wretchedness, are far beneath the poor and the sick; to those who are wrongfully looked upon as outcasts and outlaws, who are often as much sinned against as sinning, to the inmates of prisons, jails and workhouses. It is a sad commentary upon the practical Christianity of the American people, that nearly one hundred years after the epoch of Howard throughout the Great Republic, prison reform should be almost as much needed as it was in his time. In Tennessee, prison discipline and penal legislation need complete overhauling and refitting. Here, as in other instances, prevention is far more sure and economical than cure. No dangerous classes need exist in America. All the care and expense of administering the law, with a view to reformation and restoration to respectable life, rather than in the vindictive spirit which renders its victims the eternal and sworn enemies of society, is infinitesimal when compared with the loss and damage occasioned by a single paroxysmal outbreak spreading through the community.

We reach this widely ramifying subject through the daily visits to the City Workhouse, incidental to the varied duties of the Health Officer of Nashville. This institution was erected in 18—. Dr. J. W. Morton, in the First Annual Report of the Board of Health, 1875, strongly urges its removal, and the erecting a suitable new building. His views are emphatically right. It is gratifying to state that the City Council are moving in this direction, and in one or two years it is hoped that Nashville will be provided with a Model Workhouse.

By request, W. H. Yater, Captain of Police, has furnished a statement of what has been done during the year 1875 and 1876. The reader by study of this will fully comprehend how great an interest is represented by an institution almost wholly overlooked. Among our people, the Young Men's Christian Association alone seem to be interested in behalf of this and similar institutions. As tending powerfully to assist their difficult and useful work, and as directing the attention of the Christian public to great and imperative duties, every Sabbath-school library in Nashville should be furnished with a full set of the volumes published by the National Prison Congress, and ably edited by Rev. Dr. E. C. Wines, of world wide fame in this department. These volumes should be carefully studied by all Sabbath-school teachers, as bearing both directly and indirectly, by many sided relations, upon their useful work.

From much observation and inquiry at the Workhouse, I am enabled to adopt the following observations, found on pp. 446 *et seq*, of "Transactions of the Fourth N. P. C.," 1876, by Rev. Dr. Wm. G. Eliot, President of Washington University, who has been a most diligent student of this subject from the time St. Louis numbered less than 8,000 inhabitants until now, when it counts more than 450,000 within its limits.

We must also remember that in the city lock-ups, among the occupants, every night, are many who are there for the first time and for the first offense. They have been caught in bad company, or been guilty of some disorderly behavior, or found sleeping out of doors, having no "in-doors" where to sleep, or falsely accused by the blunder of a police officer, or held under suspicion. Under these or some other of the multiform accusations, just and unjust, that can be understood only by those who watch the workings of city police courts, a large number of the lock-up prisoners there take the first step of a downward career. By my observation in the police court of St. Louis, I should say at least one-tenth are

brought up either for a first and petty offense, or for no punishable offense at all. That is, not less than three thousand in course of the year. The average number in the lock-ups of that city every night, the year through, is not far from one hundred; on some nights it is three times that number.

Among them are not a few children—boys and girls—under fifteen years, whose worst fault is that they have never had a parent's love, or home, or christian care. Or they are the hapless daughters of want, not more than half grown to womanhood, driven by hunger and cold to their first clumsy 'soliciting,' for the prevention of which in future they are shut up for a whole foul night with hardened and hopeless prostitutes. Or they are young men, generally poor,—for the rich manage to escape,—caught in their first drunken spree, and, to teach them the folly of such indulgence, or to restore them to their self-respect, they are placed in a crowded pen with half a dozen professional thieves or habitual drunkards for instruction in temperance and right living.

Think, what school houses of crime are these! The city's public schools of vice and profligacy! Open for men, women and children, every day in the year, with a doubly accumulated crowd for the Lord's day! Go through the lock-ups of any large city next Sunday night, and you will see where no small part of the primary instruction in crime, yes, and advanced instruction, too, is given, and who the learners are.

It is my confident belief that in these primary schools of degradation, hitherto so much neglected, the first and most effectual work of prison discipline reform must begin. The State Penitentiary may be made never so good and conducted on the highest principles of humanity and justice, but if its inmates have already gone through the corrupting influences of city prisons and county jails, growing more hopeless at every stage, more at enmity with God and men and themselves, until their perceptions of humanity and justice are almost lost, and the basis of self-respect is all gone,—what can we do for them? How can we raise a man up, in whom there is, morally, nothing left upon which we can lay hold?

At present I may truthfully say for the able and efficient police officers of St. Louis, that they do the best they can under the circumstances, by using some measure of classification, by giving separate confinement when strongly advisable, and by keeping down the number of inmates in each cell as far as practicable. They would be glad enough to make everything better if they could, and I think I might say the same of the police departments of all our American cities. It is not among them, but among the legislators, that the "prison congress" finds its strong opponents, at every suggestion of reform. But as things now are, at all the principal lock-ups, many occupants are put into every cell, and sometimes they are crowded to a degree shocking alike to decency and common sense.

I. The city prisons, or lock-ups, should be so constructed as to give, in general, a separate cell to each prisoner, with a decent minimum of physical comfort and an ample supply of fresh air.

II. The treatment should be that of kindness, but with enforced silence and solitude, so far as other prisoners are concerned, and with a view to the hindrance of all unnecessary publicity or disgrace. Prevention of evil, rather than its correction, should be the aim.

III. The opportunity for the use of direct moral means, especially by legal

enactment, seems to be small. But no better sphere of useful service offers itself to the city missionary, to young men's christian associations, to all who are willing to work for Christ's sake, than would be afforded by every well-constructed and well-managed "city prison." The exercise of such influences might be legally recognized, though not legally provided or enforced.

PUBLIC ENLIGHTENMENT.

In Europe the masses of the people are cared for by self-styled paternal governments. And in many instances these governments do deserve the greatest commendation for excellent measures tending to the welfare of the entire public. In the United States it is directly the reverse. The power is with the people. Public authorities move only as directed from below. The people always lead. The history of sanitary reform in American cities is a constant illustration of this statement. In St. Louis, which from 1833 until 1866 had suffered from cholera epidemics, and which recently has attracted the attention of publicists because of its low death-rate, the doctors met with persistent opposition when introducing their reforms. "In 1869, the Mayor, Comptroller, and a Committee of the City Council formally protested against the filling of ponds, and publicly stated that in their opinion, many declared to be nuisances were not nuisances. That the orders of the Board relative thereto were burdensome, unjust, and inexpedient. In our early sanitary history, all orders interfering with personal profit or convenience were met by an ignorant contempt and a resolute resistance, now greatly lessened." —Report, 1876, p. 8.

Dr. Elisha Hall, whose long and successful labors in New York City have done so much to educate the American people in sanitary science, shows what is the proper function of the public boards in this regard. (See Journal of Social Science, 1870, p. 176):

There is still wanting a proper popular understanding of the subject. This want, Boards of Health may, if they will, supply by becoming public instructors in hygiene, and in the duties of citizens in regard to sanitary laws and regulations. This has been eminently true of the Metropolitan Health Acts of New York, and the Sanitary Code of the Metropolitan Board of Health. What may be done through official agencies for the better instruction of the people, is shown by the experience of England. There the operation of public health laws, under the administration of the Privy Council and local Boards of Public Health, induced thorough discussions in and out of Parliament, upon the duty and methods

of preventing and controlling contagious diseases; the removal of nuisances; the ventilation of work-houses; the hours and ages of child labor in factories; the drainage of towns; the purity of water-supplies and rivers; the nature and uses of sanitary enquiry and inspection; and a great variety of other subjects that vitally affect and interest the people. These discussions have come to be the principal source of popular intelligence as to the means of protecting and improving human health under all the varying conditions that surround the city and the hamlet, the domicile and the individual. A similur experience now falls to our lot in the City and State of New York. The popular as well as the scientific enquiries which the courts have compelled, or which the daily press has drawn forth or maintained, and the actual methods of sanitary administration, furnish regular information on sanitary subjects to the public.

Two great professions, taking the lead and uniformly sustained by the intelligent, moral and industrious of all classes, have in every case carried the day against the stolidity, selfishness and rascality of the "political bummers," who are the chronic curse of our American cities; and have no other aim in seeking office than to make a dishonest, lazy living at the expense of the honest industry of the community.

One of these professions, the clergy, have not only in America, but in all countries, been earnest, active, and zealous, in seconding the efforts of the other, or medical, in this great effort to promote the highest temporal improvement of all classes. This is the logical result of their culture and employments, which in so many points, bring them in friendly and harmonious co-operation with doctors, never in antagonism. This is most true in Nashville. From the pastors of the large, central, wealthy congregations to those having charge of missions on the outskirts, the work of the Board of Health meets with the heartiest assistance. More versed in general science than any other profession except the medical, and constantly engaged in deeds of charity among the poor, the sick, the dying, they perfectly comprehend its scope and results. Without exception they have extended the right hand of fellowship to the Health Officer. The readiness with which the church lecture-rooms were offered for the course of neighborhood lectures or talks commenced last spring by direction of the Board, and to be continued next autumn and winter; and the expressions used by the city pastors in announcing these lectures, have encouraged all parties engaged in the work, and have done much to create and foster a healthy public sentiment.

The profession, however, which everywhere should and does take the lead in sanitary reform, is that of which it is an outgrowth and a constituent department, the medical. At the present day no topic engrosses more of the attention and energy of the collective wisdom of this profession than does State Medicine in all its ramifications. This is wonderfully shown by taking up at random the annual transactions of its representative bodies. From 1870 to 1877 this is a leading topic in the volumes of the American Medical Association, discussed by its ablest members, with consummate ability. The Virginia Transactions, 1876, contains a report of the Committee on Hygiene and Public Health, by J. L. Cabell, M. D., the distinguished Professor in the University of Virginia, which is a profound treatise, wrought out with great skill and thoughtful care.

The Transactions of the South Carolina Medical Society for 1877 is mostly taken up with Dr. Munning Simons' report as Committee on State Medicine and Public Hygiene. This is also an able treatise, constantly enforced by local observations, taken mainly from the city of Charleston. No one can read this document without the earnest hope that the people of Charleston will now be able to heed its advice, and thus take the most needed step toward restoring their famous city to its former pre-eminent position as a focus of southern commerce, intellect and culture. The Transactions of the State Medical Society of Tennessee give ample evidence, specially the volumes of 1875, 1876 and 1877, that the physicians in our immediate vicinity are thoroughly enlisted in the general movement. Those of Alabama, for a number of years past, are replete with able papers on State Medicine. But the whole list is too long to enumerate. Place the entire mass of the current transactions of all the Medical Societies of the United States before us, open at random, and we will find this subject permeating it all.

The fruit of all this zeal and knowledge, when brought to bear upon the public, is well epitomized by Dr. Gouverneur M. Smith, in Transactions of the New York Academy of Medicine, 1876, p. 387:

> While neither municipal, State nor Federal legislation can enact and enforce laws so governing the private life of a citizen as to promote his healthy growth, nevertheless jurisdiction can impose laws which restrain an individual from

jeopardizing the lives of his neighbors by his sanitary negligence, and can regulate matters relating to public hygiene. The enlightened nations of the earth are now paying special attention to hygienic legislation, and to the promulgation of sanitary instruction Sovereignties and municipalities alike are vigilant in guarding the general physical welfare of the people. Intelligent Boards of Health are now established throughout our land in the larger cities, and the villages are instituting similar provisions of safety. This salutary state of affairs, which has comparatively recently been inaugurated on so comprehensive a scale, has been due to the persistent assiduity of our profession in pressing upon communities the important results to be derived from such organizations. While the Boards of Health may, at times, fall into unskilled management, such transfer can be but temporary, as the people are already convinced that scientific skill must wield the helm in such departments, and will never consent to revert to that condition of sanitary apathy which but a few years ago was so apparent to medical men.

This applies with perfect accuracy to Nashville, where the whole movement has originated with the medical profession, and where it has been under medical guidance and control, without which it has always been productive of needless expense and fruitless in benefits. Nashville, distinguished in the annals of medical education, the seat of two flourishing schools, in each of which the branch of State Medicine holds its due position, should become a marked and noted exemplar of the benefits of Preventive Medicine. From the halls of its Medical Colleges should go forth a band of graduates so instructed in advanced medicine as speedily to disseminate its blessings into every nook and corner of the wide-extended land from which they convene.

There is a calling whose members, like the doctors and the ministers, always remain at their posts in days of terror and calamity, and who control an agency indispensable to public enlightenment. The conductors of the press in Nashville have certainly exercised great liberality in behalf of sanitary reform. The columns of the daily papers have always been open to its advocates. Want of time has prevented the more frequent use of this potent instrumentality. All who have in any way labored for the public welfare in Nashville, must gratefully acknowledge the warm encouragement bestowed by the corps editorial. In this respect there are to-day in our midst worthy successors of the Hunts, Halls, Barrows, Zollicoffers, Marlings and Eastmans of the good olden time.

FINAL SUGGESTION.

After much careful thought, and after conferring with men of prudence and experience representing all classes and interests, the suggestion is now deliberately made and strongly urged upon the Board, that a direct appeal be made to the people of Nashville, so as to accomplish in a few months, and once for all, what otherwise will require years of halting and unsatisfactory effort. Let the Board carefully prepare a Sanitary Code, complete in all respects, and carefully adapted to the peculiar conditions of Nashville. Let the City Council appoint a day, given ample time for discussion, for an election, by which this code as a whole or in parts shall be adopted or rejected. The entire subject will thus be taken away from all complications with local politics. The people will be fully educated upon the issues, and no fears need be entertained for the results.

The physicians of Nashville have indeed pretty thoroughly aroused the masses to the necessity of making the city a place where poor men who cannot run away from epidemics and summer heats may be willing to keep their families. From much talk in the alleys, street cars, and all about, I know that the people, rich and poor, are vastly in advance of the City Hall, and am perfectly confident that the vote on this question will do the community as much credit as its decision of the hog question September 27, 1873, or the water-works extension September 30, 1876. In the former case the vote was, for hogs, 2,197; against, 2,202. In the latter, for new engine, 2,380; against, 474. In neither case was there much public discussion. The decision of the hog question does the native good sense of the people credit. One of the best health officers in Great Britain lost his position in a large city, some years ago, because of faithfulness in executing the ordinances against these filthy animals.

AVOIDABLE LOSSES—COUNTING THE COST.

The tables at the close of this Report, show the actual death-rates of the principal American and European cities. The normal or lowest death-rate has been estimated by statisticians, at 11 to one thousand in rural districts, and 17 in cities. Great reductions may be made in present rates. That of Nashville for

instance should not be higher than that of Cleveland, St. Louis or Louisville. This would be a saving of at least 15 lives per annum per thousand. In other words, of 405 lives in a year. All would lay much stress upon such an increased population annually by immigration. Our own children and neighbors saved to us are a thousand fold more valuable.

Another most important consideration is the relation between the sickness rate and the death-rate. Dr. Playfair; of England, after careful inquiry, computed the ratio of one death to twenty-eight cases of sickness, for a mixed population of all ages. Hence, in Nashville 11,340 cases of sickness occur annually, which ought to be prevented.

Still another relation, showing also why Benjamin Franklin, the acutest practical philosopher the world as yet produced, conceived the famous axiom, "health is wealth." English statisticians have estimated that, in that country for every death there are two constantly sick, in other words, that every death implies a total average of 730 days of sickness. Doubtless in America this proportion is greater. Now in Nashville there are 405 deaths annually which ought not to take place. And consequently, 295,650 days of illness which ought not to occur. Various estimates are made as to the loss occasioned by all this sickness. The value of labor and the cost of nursing, medical attendance and medicines differ greatly in different countries. Here it will not be much out of the way to estimate the labor lost or the expense incurred on an average at fifty cents for each day. This makes a pecuniary loss to Nashville of $147,825 per annum. These figures seem very high. Yet one official in our city government has paid for one case of sickness, about seven hundred dollars in two years. The cost of sickness is great, but much overlooked.

For these avoidable 405 deaths annually; for these preventable 11,340 cases of sickness; for these unnecessary 295,650 days of illness; for this enormous useless waste of needed labor, the public authorities of Nashville are to blame.*

* This subject of responsibility has been ably worked up by Hon. Lewis H. Steiner, M. D., of Frederick, Maryland, in a treatise on the old question, "Am I my brother's keeper?" It would be well for each person clothed with the great, but little felt, responsibility of legislating for State or Municipality, to study its contents. See Reports and Papers of the American Public Health Association. Vol. II.

There are losses, however, resulting from avoidable disease and death which can not be overlooked. They are sudden, sharp and of overwhelming magnitude; occasional it is true, but making deep and indelible marks. Epidemics are the terror of the human family. Only two other curses, famine and war, claim equal rank. Yet each and all may be prevented. Quarrels, as that crowning achievement of modern jurisprudence and resplendent gem in the diadem of American glory, the Geneva Court of Arbitration, amply demonstrates, may be settled without appeal to the chances of battle. The millions of acres claiming culture prove that the earth is not yet overcrowded. And it is no chimera to anticipate the cessation of epidemic diseases with all the accompanying train of horrors.

One of the greatest minds, as well as noblest men yet produced by the Western Hemisphere, was the illustrious physician, Benjamin Rush, of Phidelphia. He was, more than most men, familiar with yellow fever, malarial diseases, and all descriptions of misery. Friend and cotemporary and equal of Franklin and Washington, he foresaw what science would do, and what government ought to do. Hence, nearly a century since in his "Essay on Summer and Autumnal Diseases," he uttered a prediction, which to-day is thundered at the ears of rulers both in Europe and America, by scores of modern scientists.

> To all natural evils, the Author of nature has kindly prepared an antidote. Pestilential fevers furnish no exception to this remark. The means of preventing them are as much under the power of human reason and industry, as the means of preventing the evils of lightning and common fire. I am so satisfied with this opinion, that I look for the time when our courts of law will punish cities and villages for permitting any of the sources of malignant fever to exist within their jurisdiction.

Space does not allow a presentation of the enormous losses occasioned by epidemics. One or two facts must here suffice, Dr. Benjamin Lee, of Philadelphia, gives in Volume II, of P. H. A. Reports, a most elaborate paper, in which he shows that the epidemic of small-pox in 1871 and 1872 cost that city a total of $21,848,977.99.

Dr. Ely McClellan, in Second Georgia, p. 194, gives the following summary, made up from information very carefully collected, of the losses caused to Savannah by the terrible epidemic of yellow fever in 1876.

TOTAL ESTIMATES.

I. Loss by the expenditures of over 8,000 refugees,	$ 500,000
II. Loss in sales of merchandise,	500,000
III. Loss in diminution of cotton for export	75,000
IV. Loss to railroad corporations,	200,000
V. Loss in rents and in depreciation of property,	300,000
VI. Loss of taxes to the city,	50,000
VII. Loss of taxes to the State,	100,534
VIII. Loss to professional men,	30,000
IX. Loss to hotel proprietors,	25,000
X. Loss of wages to the working classes,	1,237,960
XI. Loss in human life,	2,443,000
XII. Loss in interment of the dead,	31,480
XIII. Loss in the care of the sick,	37,500
XIV. Loss in the cost of special sanitary work,	41,000
XV. Loss in amount expended in charity,	120,883
	$5,862,357

The cost of an epidemic was impressed upon all America by the wonderful facts connected with the yellow fever in Memphis, 1873. Dr. Jerome Cochran sums these up in a striking manner, thus:

The population of Memphis at the advent of the epidemic may be stated at about 45,000. In the general exodus that ensued it is estimated that 20,000 persons sought safety in flight, leaving 25,000 at the mercy of the pestilence. The number of cases is roughly estimated at from 7,000 to 10,000. The mortality is stated by Dr. Eskine at 1,800. But I have seen a list of the deaths containing 2,000 names. Upon this basis the mortality is from 20 to 25 *per centum* of the cases.

There are some circumstances connected with this Memphis epidemic, not of a medical character, which are worthy of mention even in this brief account of it.

When the stricken city found herself in the dreadful embrace of the pestilence, she was obliged to send abroad an appeal for help. To this appeal the whole country, from Maine to California, and from the rice fields and palmetto groves of South Carolina to the pine forests and frozen lakes of the North-west, responded in most liberal contributions of money and supplies. The subjoined table will show the amounts received by the various Associations which were engaged in the relief of the sick, and also the amounts left on hand at the close of the pestilence:

ASSOCIATIONS.	RECEIVED.	REMAINING
Howard Association	$124,245	$46,999
Masonic Relief	32,926	16,699
Odd Fellows' Relief	46,606	30,982
German Relief	8,576	1,108
Citizens' Relief	91,713	11,506
Fire Relief	5,548	3,121
Shoulder to Shoulder	2,501	141
Police Relief	12,875	7,426
Knights of Pythias	6,579	1,949
Totals	$331,589	$119,848

From this it will be seen that large as was the demand for assistance, the contributions made were still larger, showing an aggregate net excess of 120,000 dollars—more than one-third of the aggregate sum of the contributions.

Memphis and New Orleans have been put back immeasurably by the folly of not listening to their doctors. Had they done so, long since would they have doubled in population and wealth. When the latter city was occupied by the United States army in 1862, 1863, 1864 and 1865, it had immunity from yellow fever because the able medical staff which serves the Government, insisted upon observing the sanitary measures so long, but vainly, urged upon the city authorities by Erasmus D. Fenner and other representative physicians of New Orleans.

Nashville is not a stranger to the magnitude of losses resulting from epidemics. The last one, cholera in 1873, was fairly out on June 6th, and by the 10th day of that month the newspapers estimated that 10,000 persons had fled the city. The total cessation of business for weeks was a great damage. The direct expenditure by the public was remarkably light, as shown by records carefully compiled by Thomas L. Brennan, Secretary of the Robertson Association. The city expended $10,000, the County Court $3,052, and the Robertson Association $1,918.44, making in all $14,970.44. It is evident that a vast deal of suffering must have been relieved by individual charity. The Robertson Association got all the money it needed by making one short appeal to the citizens. In exactly two weeks after making said appeal it gave public notice that it wanted no more funds. Later in the season, from the overplus, it sent free-will offerings to Shreveport and Memphis.

The readiness with which Nashville meets and manages its cholera epidemics, and the rapidity with which it recovers from their evanescent effects, furnish material for much civic pride to one who, like myself, have witnessed its behavior under each and all, from the first in 1832, to that of 1873. Still cholera has no business here, and should be kept at a distance.

Cholera is no longer the pestilence that walketh in darkness. Modern medical science has shed a flood of light all about its pathway. If Nashville, and other Tennessee cities and towns, are ever again placed under terror and untold losses by this foul plague, nursed in oriental filth, an exotic wanderer, seeking

congenial homes in this distant American land, it will be due alone to the culpable neglect of the public authorities who only can guard the public health.

The cholera of 1873, in Nashville, shows how instinctively a community in time of pestilence turns to its doctors.

In the Nashville *Union and American*, June 8, 1873, appears a communication by the Mayor, Thomas A. Kercheval, appointing a "Sanitary Commission," with virtually the functions of a Board of Health. It closes as follows: "I will do all in my power to have such a line of policy carried out as they in their wisdom, as a Sanitary Board may suggest. I hereby appoint the following named physicians to constitute said Sanitary Commission: J. D. Plunket, J. W. Stout, J. P. Conwell, J. Saudek, J. W. Sneed, T. H. P. Pool, Thomas Menees, T. A. Atchison, C. K. Winston, G. Schiff, J. W. McMurray, J. W. Maddin.

This Commission met and chose Dr. Plunket, chairman. It, to some extent, discharged the functions of a Board of Health, being very active in the work of disinfecting, inspecting and encouraging the people.

THE FUTURE OF NASHVILLE.

Cities do not spring up by chance. Without exaggeration, they are the highest results of both divine and human design and skill to be found on this terraqueous globe. Their sites are prepared by nature, the divine hand, and improved by man's exercise of all his faculties through many successive generations. Cities are centers of power, religion, art, science, culture and commerce. Their names have become typical of all that adorns and elevates the human race, as well as occasionally of that which degrades him beneath the beast.

Different elements unite and combine to give cities pre-eminence in renown or influence. Sometimes a single charteristic places a city on a pedestal. Geneva, the world over, is a synonyme for intellect and liberty. Florence and Munich are but other names for art.

In Nashville three quite diverse elements must contribute to build up a city of one hundred thousand people in a few years, and ultimately a grand interior emporium as noted as Lyons or Dresden.

At present the leading feature in Nashville is its commerce. The great warehouses on the Public Square, and the enormous buildings on the business streets devoted to purposes of trade, attract the marked attention of the traveler. On inquiry, it is ascertained that the operations of commerce are on a scale even vaster than that indicated by these magnificent structures.

No better proof need be given of the great enterprise, skill and integrity of the commercial element in Nashville than such facts. With constantly improving railway and river facilities, and with the advancing development of the wide and rich region of which it is the centre, the commerce of Nashville may be considered as yet but in its infancy, though the infancy be that of a Hercules.

Mercantile prosperity gives riches and large hearts; without which, no great city. Numbers come mainly through handicrafts. Herein Nashville has always been deficient. Her manufacturing and mechanical establishments have hitherto been mere rudimentary attempts, not culminating in great and permanent factories, employing myriads of intelligent artisans, and distributing their wares and fabrics throughout the land. In the midst of a country peculiarly gifted by nature with all the most precious raw materials—animal, vegetable and mineral; and with a distributing net-work of railways radiating in all directions; and with the two great domestic attractions of cheap food and free schools,—it is indeed remarkable that Nashville has not long since taken a high rank as a manufacturing centre. The causes are patent to the close and reflecting observer. Removed, as is easily practicable, and in less than twenty years the dreams, visions and plans of our old but far-sighted citizens, the Steins, Claibornes and Morgans, will be more than realized.

Intellectual influence and pre-eminence, to which, *ex necessitate*, all other prosperities must bow and pay tribute, or else perish in the living, has from its origin been the justly prized glory of Nashville. A seat of learning and of political and military ability, it has always been known and honored in the great federation constituting the American nation. How this exalted reputation in *ante bellum* days had made its impression upon our citizenship, will appear from the words of the late gifted John

A. McEwen, spoken in 1853 to assembled thousands on the University campus:

> We stand upon a new starting-point of enterprise. The stagnant wave that has so long environed our inland city has received a fresh impetus, its vast bosom is beginning to heave, and our influence and power are carried out by its every emotion. The shadows of a mighty city are fast peopling the vacant space about us. The progress of Nashville is no longer a dream of the imagination—the hope of self-interest. It is clearly written in every sign we see, in every sound we hear. The signet of no mean destiny is on the brow of the young city. In achieving it, I would have her not mistake the means and appliances by which it is to be most honorably attained and held. While others may boast of their teeming population, their overflowing treasuries, their graceful ships or burning cars, their fabrics woven of the fibres of every clime, let it be the glory of Nashville that, though she may exult in all that constitutes the physical magnificence of a metropolis, she takes an especial pride in witnessing the intelligence, the mental power and the capacity for elevated happiness, diffused and cherished by her seats of Letters, and, as she points to these institutions, raising here and there their chaste and classic forms, let her say, "THESE ARE MY JEWELS!"

Still more appropriate is this language now. For years previous to the cataclysm of 1861, the educational establishments of Nashville, public and private, attracted hither from distant localities fully one thousand pupils per annum. Now, with these institutions more than quadrupled in number and decupled in endowment and support, an annual average of two thousand is quite within the mark. As to influence, usefulness and honorable renown, the brightest visions of Philip Lindsley,* when he turned away from the presidency of the College of New Jersey to devote his life and labor to the educational development of Nashville and Tennessee, did not come up to what we now see partly realized as the first fruits of plans extending through long centuries to come, and reaching over two vast continents in either hemisphere. This great future can alone be blighted by our own stupidity and blind lethargy.

In order that artisans and students may flock to Nashville in numbers commensurate with the substantial commercial basis already so firmly established, two great forward movements must be made, each so intertwined with the other as to form one harmonious whole. Artificial Nashville must correspond with natu-

*See Inaugural Address of 1825, and Baccalaureate of 1826, in vol. I., pp. 63-171, of "The Works of Philip Lindsley, D. D. Edited by LeRoy J. Halsey, D. D. 1866."

ral Nashville, and the now wide-extended city be kept in the high state of health to which it is entitled by soil and climate.* Beyond contradiction, for narrowness of limits Nashville is an anomally among American cities. Its corporate authority extends over scant four square miles. Very many farmers in Tennessee exercise power over larger domains. Without exception, American cities have grown up by first extending the limits far into the country, and then gradually adorning and building up this incorporated territory. Cleveland, with a population of 162,000, and planning for at least 500,000, has an area of five square miles more than New York, with its millions. Forty-five years since, the New Yorkers were much laughed at by British travelers for having indulged in the American figure of anticipation to the extent of taking into the city all Manhattan island. In 1873, it took in some twelve thousand acres beyond the island. How can a city have central parks, croton reservoirs, numerous well-sited hospitals, and other great public concerns, unless its thinking men do anticipate?

Worse than mere contraction of lines, Nashville has one-third its population outside these lines and under other corporations. Hence imaginary or real conflict of interests, and consequent miserable litigious contentions. This vital defect will become more and more pregnant with evil fruits as these suburbs become more populous. The history of Philadelphia is a warning and a guide on a large scale. A little more than thirty years back and it was famous for rows and quarrels between the city proper and the half score of districts around by which it was hemmed in. The wise men of Philadelphia came together. All these little and sub-corporations, together with long miles of outside farms, were combined. Every acre of this territory has since been built upon. Philadelphia has maintained its position of second city on the western hemisphere, and is specially noted for comfort as a dwelling place. More recently Boston has furnished an example of the many benefits resulting from the combination of

*To those who will persist in considering all broad and far-reaching efforts to make a great city here out of Nashville and its surroundings, utopian, the statement made by the statesman and scholar, Alexander Stephens, of Georgia, is commended. The Chattanooga *Times*, of August 14, 1877, speaking of the brilliant prophecies made by Mr. Stephens as to the future greatness of enterprising Atlanta, alludes to his statement that "in the oldest countries of the world inland cities are the largest."

large, scattered, incomplete suburbs with the central compact city.

The people of the city of Nashville, of the city of Edgefield, of the Thirteenth, Tenth, and other civil districts contiguous to Nashville and Edgefield, should counsel together, and agree upon fair and equitable terms for a new and comprehensive city charter, which should embrace sufficient territory for a large city. Of course, until actually built upon as city lots, farms, as in all the instances cited above, must be taxed only as farms. On the other hand, by the systematic extension of streets with gas, water, drainage, schools, and so on, all this region would attract citizens from large classes of foreign and American people who now never think of looking hitherward for homes and occupation. On a previous page the necessity of this step, as a preliminary to all permanent and lasting sanitary reform, has been incidentally mentioned. Prof. William K. Bowling takes the position that all efforts in this direction are nugatory while a dense population is crowded almost to the very doors of the capitol, and yet are beyond the corporation line. There is hardly a great channel for natural drainage which does not lie partly without this line. All the great new universities, with one exception, are beyond it. Within it there are but few localities where sites can be found spacious enough for parks, asylums, sanitariums, schools, manufactories, and numerous undertakings projected by active citizens or enterprising strangers who may look at Nashville for this purpose. All such schemes require large grounds, together with every facility of city life.

Plan for a city, not for a contracted village. Then let the city be pre-eminent for health. This will be for the common good of all, and for the honor of Tennessee.

From that memorable twenty-fourth day of April, 1780, when John Donelson, the daring voyager, with the women and children, met James Robertson, the soldier-statesman, with the husbands and sons—as strange and successful combination of distant movements as history records—Nashville has been a *punctum saliens* for Tennessee.

Massachusetts, by common consent at the head of the Eastern States in schools, academies and universities, is, by like unani*mous* verdict, far in the lead upon State Medicine. Michigan,

universally acknowledged as the educational exemplar of the young, vigorous, and aspiring States of the North and Far West, is equally so in public hygiene. Tennessee, eminent from its very conception until this good day for teachers and teaching, and now, after much and deliberate planning, chosen by at least seven great populous Christian churches as the centre for the highest culture, owes it alike to the past and the future, to her own children, and to the millions of generous friends east, west, north, south, and in far off Britain, to align herself with Massachusetts and Michigan. The medical profession of the State look to the Boards of Health in Nashville, Memphis, Knoxville, Chattanooga, and other cities, so to bring out and forward their great work that the General Assembly will unhesitatingly take it up in 1879, and so legislate that Texas, Arkansas, Mississippi, and other regions peopled with our kindred, may look to Tennessee no less than to Massachusetts and Michigan for teaching and example in State Medicine.

In 1873, cholera and yellow fever epidemics made Tennessee renowned in America and Europe as the plague-stricken State. If her legislators will but listen to her doctors, in a few years Tennessee will be no less renowned for salubrity of climate, healthfulness of people, and exemption from all epidemic diseases.

STATISTICS OF CITY PATIENTS IN UNIVERSITY HOSPITAL FOR THE YEAR 1876.

MONTHS.	Number Treated.	Number Died.	Male.	Female.	White.	Colored.
January	38	2	20	18	23	15
February	26	1	16	20	19	17
March	45	3	20	25	26	19
April	50	4	23	27	32	18
May	40	2	19	21	27	13
June	44	3	17	27	29	15
July	52	3	22	30	35	17
August	53	2	25	28	33	20
September	59	6	35	24	38	21
October	58	3	33	25	40	18.
November	61	6	31	30	44	17
December	56	4	35	21	33	23
Total	582	39	296	296	379	213

SUMMARY OF WORK-HOUSE STATISTICS FOR THE YEAR ENDING SEPTEMBER 30, 1876.

Violation State laws	175
Violation city ordinances	3,329
Miscellaneous arrests	35
White	1,944
Colored	1,595
Married	1,240
Single	2,204
Unknown whether married or single	95
Able to read and write	1,831
Unable to read or write	1,637
Unknown whether able to read or write	71
Males	2,778
Females	761
Persons arrested no warrants issued	18

Months.	White.		Colored.		Married.	Single.	Able to Read and Write.	Unable to Read and Write.	Married or Single Unknown	Read or Write Unknown.
	Male.	Female.	Male.	Female.						
1875—October	103	13	84	45	70	167	123	117	8	5
November	104	17	88	30	85	150	107	128	4	4
December	141	21	116	69	132	204	157	178	11	12
1876—January	103	21	92	28	79	161	130	113	4	1
February	121	8	53	25	72	132	127	76	3	4
March	162	13	99	35	129	160	171	124	20	14
April	185	22	77	44	105	209	182	134	14	12
May	129	18	82	50	96	174	141	134	9	4
June	131	34	89	55	102	197	146	154	10	9
July	161	31	103	33	110	212	168	157	6	3
August	174	36	116	45	144	223	191	179	4	1
September	169	27	96	41	116	215	188	143	2	2
Total	1683	261	1095	500	1240	2204	1831	1637	95.	71

The total number of arrests made during the twelve months ending September 30, 1876, were		3,539
Being a decrease from the year previous of		128
From 10 to 20 years of age	925	
" 20 to 30 " "	1,372	
" 30 to 40 " "	715	
" 40 to 50 " "	325	
" 50 to 60 " "	91	
" 60 to 70 " "	18	
" 70 to 80 " "	1	
" 80 to 90 " "	4	
Unknown	88	
		3,539

CENSUS OF NASHVILLE, TAKEN MAY, 1877.—*White.*

WARDS.	Total in Wards.	SEX.		AGES.															NATIVITY.						
		No. of Males.	No. of Females.	Under 1 year.	From 1 to 2.	From 2 to 3.	From 3 to 4.	From 4 to 5.	From 5 to 10.	From 10 to 15.	From 15 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 100.	Nashville, Tenn.	Other parts of Tennessee.	Other parts of United States.	Germany.	Ireland.	Great Britain.	Other Foreigners.
1st.....	980	619	361	20	17	23	20	22	70	82	105	256	183	97	50	22	11	2	315	288	189	68	35	11	74
2d	1,317	673	644	28	27	31	29	37	120	104	162	346	212	137	60	13	10	1	465	306	288	79	51	24	104
3d	2,300	1,239	1,061	45	51	44	53	41	198	168	265	577	408	240	123	55	26	6	784	662	559	24	153	44	74
4th	1,020	450	570	26	19	30	10	29	116	81	123	212	152	111	71	23	13	4	421	176	235	38	130	10	10
5th	1,553	676	877	32	26	43	40	31	160	138	257	259	247	172	93	35	17	3	562	480	362	28	100	10	11
6th	2,198	1,083	1,115	60	44	59	62	64	302	223	242	391	323	216	144	53	14	1	934	702	385	42	90	17	28
7th	2,148	1,047	1,101	63	62	65	55	71	293	256	235	347	305	212	115	50	16	3	947	826	277	11	54	15	18
8th	2,326	1,098	1,228	86	56	68	77	57	312	241	269	410	307	220	148	51	18	6	982	696	446	75	85	31	11
9th	1,838	889	949	57	66	54	54	55	249	220	194	293	217	219	115	34	9	2	847	348	281	289	29	31	13
10th	1,823	878	945	66	49	55	39	41	268	203	192	296	246	219	92	41	15	2	745	357	358	30	283	46	4
Tot'l white	17,503	8,652	8,851	483	417	472	439	448	2,088	1,716	2,044	3,387	2,600	1,842	1,011	377	149	30	7,002	4,841	3,380	684	1,010	239	347

CENSUS OF NASHVILLE, TAKEN MAY, 1877.—*Colored.*

WARDS.	Total in Wards.	SEX.		AGES.															NATIVITY.				
		No. of Males.	No. of Females.	Under 1 year.	From 1 to 2.	From 2 to 3.	From 3 to 4.	From 4 to 5.	From 5 to 10.	From 10 to 15.	From 15 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 100.	Nashville, Tenn.	Other parts of Tennessee.	Other parts of United States.	Great Britain.	Other Foreigners.
1st	433	188	245	18	8	8	11	8	49	28	45	115	60	49	13	18	2	1	145	241	47	...	...
2d	951	405	546	26	26	24	25	31	104	79	101	204	165	98	45	14	8	1	286	547	118	...	...
3d	892	303	589	18	14	9	19	18	59	59	101	219	181	108	65	17	4	1	240	579	69	...	4
4th	1,522	627	895	62	44	36	41	38	143	124	131	288	249	120	37	13	8	...	565	651	305	1	...
5th	913	346	567	21	18	26	18	16	86	58	108	184	163	113	61	30	9	2	359	366	188	...	...
6th	1,460	619	841	42	34	40	35	48	175	120	104	273	257	162	117	40	10	3	469	756	234	...	1
7th	1,109	508	601	44	37	43	35	35	122	112	97	215	139	117	68	30	10	5	329	626	154	...	...
8th	723	287	436	32	15	21	24	20	88	62	52	118	110	87	61	24	8	1	241	347	134	...	1
9th	412	176	236	23	11	7	17	12	59	37	31	66	55	47	25	18	3	1	189	175	48	...	...
10th	1,167	507	660	36	33	37	30	25	174	119	78	169	217	131	76	28	9	5	391	587	188	...	1
Total colored	9,582	3,966	5,616	322	240	251	255	251	1,069	803	848	1,851	1,595	1,186	651	256	71	28	3,214	4,875	1,485	1	7

CENSUS OF NASHVILLE, TAKEN MAY, 1877.—POPULATION BY WARDS.

WARDS.	Total in Wards.	SEX.		AGES.															NATIVITY.						
		No. of Males.	No. of Females.	Under 1 year.	From 1 to 2.	From 2 to 3.	From 3 to 4.	From 4 to 5.	From 5 to 10.	From 10 to 15.	From 15 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.	From 70 to 80.	From 80 to 100.	Nashville, Tenn.	Other parts of Tennessee.	Other parts of United States.	Germany.	Ireland.	Great Britain.	Other Foreigners.
First	1413	807	606	38	25	31	31	30	119	110	150	371	243	146	63	40	13	3	460	529	236	68	35	11	74
Second	2268	1078	1190	54	53	55	54	68	224	183	263	550	377	235	105	27	18	2	751	853	406	79	51	24	104
Third	3192	1542	1650	63	65	53	72	59	257	227	366	796	589	348	188	72	30	7	1024	1241	628	24	153	44	78
Fourth	2542	1077	1465	88	63	66	51	67	259	205	254	500	401	231	108	36	21	4	986	827	540	38	130	11	10
Fifth	2466	1022	1444	53	44	69	58	47	246	196	365	443	410	285	154	65	26	5	921	846	550	28	100	10	11
Sixth	3659	1702	1956	102	78	99	97	112	477	343	346	664	580	378	261	93	24	4	1403	1458	619	42	90	17	29
Seventh	3257	1555	1702	107	99	108	90	106	415	368	332	562	444	329	183	80	26	8	1276	1452	431	11	54	15	18
Eighth	3049	1385	1664	118	71	89	101	77	400	303	321	528	417	307	209	75	26	7	1223	1043	580	75	85	31	12
Ninth	2250	1065	1185	80	77	61	71	67	308	257	225	359	272	266	140	52	12	3	1036	523	329	289	29	31	13
Tenth	2990	1385	1605	102	82	92	69	66	442	322	270	465	463	349	168	69	24	7	1136	943	546	30	283	46	5
Total Pop'n City	27,085	12,618	14,467	805	657	723	694	699	3,157	2,519	2,892	5,238	4,195	3,028	1,662	633	225	58	10,216	9716	4865	684	1010	240	354

Summary of Sanitary Survey of Nashville, taken May, 1877.

Character of Houses.

WARDS.	Brick Houses.	Frame Houses.	Stone Houses.	Log Houses.	Shanties.	Brick Stores.	Frame Stores.	STORIES. One.	Two.	Three.	Four.	Five.	Livery Stables.	Slaughter Houses.	Soap Factories.	Dry Cellars.	Wet Cellars.
1st Ward.																	
White.....	390	42	3	.....	3	334	9	54	142	188	16	8	9	.....	.....	228	91
Colored ..	11	19	.....	1	9	1	.....	19	15	3	.....	.....	1	.....	.....	6	6
Total	401	61	3	1	12	335	9	73	157	191	16	8	10	.....	.....	234	97
2d Ward.																	
White.....	148	30	1	1	4	72	12	62	163	30	13	.....	2	.....	.....	133	39
Colored...	46	31	.....	1	9	1	.....	44	44	1	.....	.....	.....	.....	.....	15	7
Total	194	61	1	2	13	73	12	106	207	31	13	.....	2	.....	.....	148	46
3d Ward.																	
White	231	27	2	.....	4	98	8	48	254	63	6	1	2	.....	.....	129	79
Colored...	19	8	.....	.....	5	3	.....	15	19	2	.....	.....	.....	.....	.....	2	7
Total.....	250	35	2	.....	9	101	8	63	273	65	6	1	2	.....	.....	131	86
4th Ward.																	
White.....	147	39	1	3	3	6	.....	88	98	5	.....	.....	2	.....	.....	42	9
Colored...	128	86	.....	4	28	2	.....	148	89	1	.....	.....	.....	.....	.....	26	5
Total.....	275	125	1	7	31	8	.....	236	187	6	.....	.....	2	.....	.....	68	14
5th Ward.																	
White.....	158	48	1	.....	2	23	5	59	148	16	.....	.....	1	.....	.....	103	7
Colored...	29	51	.....	.....	47	1	2	104	29	.....	.....	.....	.....	.....	.....	7	1
Total.....	187	99	1	.....	49	24	7	163	177	16	.....	.....	1	.....	.....	110	8
6th Ward.																	
White.....	207	155	2	2	9	18	20	229	274	3	.....	.....	6	.....	.....	28	10
Colored...	56	127	2	10	76	6	2	204	42	.....	.....	.....	.....	.....	.....	3	3
Total.....	263	282	4	12	85	24	22	433	316	3	.....	.....	6	.....	.....	31	13
7th Ward.																	
White.....	121	240	1	3	17	4	16	311	73	4	1	.....	.....	.....	.....	35	24
Colored...	24	80	1	2	88	.....	.....	162	23	.....	.....	.....	.....	.....	.....	3	.....
Total.....	145	320	2	5	105	4	16	473	96	4	1	.....	.....	.....	.....	38	24
8th Ward.																	
White.....	159	250	1	2	1	16	6	296	129	16	.....	.....	.....	.....	.....	29	31
Colored...	13	48	.....	1	40	.....	.....	91	10	.....	.....	.....	.....	.....	.....	2	.....
Total	172	298	1	3	41	16	6	387	139	16	.....	.....	.....	.....	.....	31	31
9th Ward.																	
White.....	133	190	1	2	6	15	15	264	85	.....	.....	.....	.....	4	1	115	52
Colored..	5	30	1		29	.....	.....	57	5	.....	.....	.....	.....	.....	.....	1	5
Total.....	138	220	2	2	35	15	15	321	90	.....	.....	.....	.....	4	1	116	57
10th Ward.																	
White.....	132	140	.....	1	26	17	12	226	102	1	.....	.....	.....	.....	.....	63	27
Colored...	21	61	.....	5	100	.....	.....	154	20	.....	.....	.....	.....	.....	.....	3	3
Total.....	153	201	.....	6	126	17	12	380	122	1	.....	.....	.....	.....	.....	66	30
Total white	1826	1161	13	15	75	605	103	1637	1468	325	36	9	22	4	1	905	369
Total col'd	352	541	4	24	431	14	4	998	296	7	.....	.....	1	.....	.....	38	37
Total.....	2178	1702	17	39	506	619	107	2635	1764	332	36	9	23	4	1	943	406

Summary of Sanitary Survey of Nashville, taken May, 1877.

WARDS.	MODE OF LIGHTING AND HEATING.									WATER SUPPLY.			
	Gas.	Coal Oil.	Candles.	Grate.	Stove.	Wood Stove.	Wood Fire Place.	Furnace.	Steam.	Hydrants.	Wells	Spring.	Cistern.
First Ward.													
White	176	70	29	65	284	3	2	5	.....	380	.....	12	.....
Colored	2	35	2	7	14	7	10	.....	.....	35	2	4	1
Total	178	105	31	72	298	10	12	5	.....	415	2	16	1
Second Ward.													
White	108	132	4	152	168	6	7	.....	.....	249	2	13	.....
Colored	2	85	.....	13	37	11	20	.....	.....	55	2	30	.....
Total	110	217	4	165	205	17	27	.....	.....	304	4	43	.....
Third Ward													
White	252	90	3	213	117	.....	.....	17	2	361	.....	.....	.....
Colored	5	31	1	7	20	.....	7	.....	.....	28	.....	5	.....
Total	257	121	4	220	137	.....	7	17	2	389	.....	5	.....
Fourth Ward.													
White	73	118	1	149	22	.....	5	.....	.....	161	8	18	.....
Colored	3	235	2	114	70	2	39	.....	.....	142	3	92	.....
Total	76	353	3	263	92	2	44	.....	.....	303	11	110	.....
Fifth Ward.													
White	161	57	1	196	18	1	.....	4	.....	198	6	7	
Colored	.....	141	.....	73	51	1	6	.....	.....	73	9	50	3
													1
Total	161	198	1	269	69	2	6	4	.....	271	15	57	4
Sixth Ward.													
White	110	260	15	347	40	.....	17	.....	.....	348	7	38	
Colored	1	242	4	98	101	.....	69	.....	.....	143	29	84	.....
Total	111	502	19	445	141	.....	86	.....	.....	491	36	122	.....
Seventh Ward.													
White	41	355	3	345	19	.....	16	.....	1	271	77	34	8
Colored	.....	190	.....	88	34	10	58	.....	.....	31	57	101	1
Total	41	545	3	433	53	10	74	.....	1	302	134	135	9
Eighth Ward.													
White	106	328	6	390	7	.....	7	.....	1	343	15	56	16
Colored	1	100	.....	33	25	.....	23	.....	.....	19	3	72	.....
Total	107	428	6	425	32	.....	30	.....	1	362	18	128	16
Ninth Ward.													
White	80	247	14	235	83	3	5	.....	.....	280	27	33	10
Colored	.....	60	2	23	27	1	13	.....	.....	18	2	44	.....
Total	80	307	16	258	110	4	18	.....	.....	298	29	77	10
Tenth Ward.													
White	68	255	3	271	47	6	2	.....	.....	182	76	28	39
Colored	1	186	.....	31	82	22	45	.....	.....	60	33	66	5
Total	69	441	3	302	129	28	47	.....	.....	242	109	94	44
Total White	1175	1912	79	2460	805	19	61	26	4	2773	218	239	76
Total Colored	15	1305	11	387	461	54	590	.....	.....	604	140	548	8
Sum Total	1190	3217	90	2847	1266	73	351	26	4	3377	358	787	84

The above figures allude to households.

Summary of Sanitary Survey of Nashville, taken May, 1877.

Bath-tubs, Privies and Drainage.

WARDS.	Bath Tubs.	Water Closet in House.	Water Closet in Yard.	Vaults.	Pitts.	Boxes.	Surface.	Earth Boxes.	Cesspools.	Sewerage.	Surface Sewerage.	Subter. Outlets.
First Ward.												
White	16	160	27	5	143	10	29	2	2	158	5	6
Colored	...	...	...	...	20	2	15	...	...	...	...	...
Total	16	160	27	5	163	12	44	2	2	158	5	6
Second Ward.												
White	21	60	19	...	160	2	21	...	1	53	20	...
Colored	...	1	...	...	49	...	33	...	...	...	1	...
Total	21	61	19	...	209	2	54	...	1	53	21	...
Third Ward.												
White	103	114	48	...	188	19	24	2	11	138	...	5
Colored	...	1	2	...	20	4	6	...	...	7	...	...
Total	103	115	50	...	208	23	30	2	11	145	...	5
Fourth Ward.												
White	26	9	10	4	104	39	30	...	...	15	8	...
Colored	1	1	...	...	126	33	69	...	...	...	...	...
Total	27	10	10	4	230	72	99	...	...	15	8	...
Fifth Ward.												
White	82	68	6	...	116	8	51	...	13	25	...	9
Colored	...	...	1	...	37	6	56	...	...	1	...	...
Total	82	68	7	...	153	14	107	...	13	26	...	9
Sitxh Ward.												
White	13	11	....	3	58	61	265	1	...	9	...	1
Colored	...	...	...	...	9	12	235	...	...	6	...	...
Total	13	11	...	3	67	73	500	1	...	15	....	1
Seventh Ward.												
White	9	7	1	...	52	50	284	...	...	1	1	1
Colored	...	...	...	...	2	2	178	...	...	...	...	...
Total	9	7	1	...	54	52	462	...	...	1	1	1
Eighth Ward.												
White	26	7	1	...	107	19	302	...	1	...	...	2
Colored	...	...	...	...	5	3	79	...	...	...	...	...
Total	26	7	1	...	112	22	381	...	1	...	...	2
Ninth Ward.												
White	13	4	...	1	200	2	141	...	4	1	...	...
Colored	...	...	...	...	16	...	48	...	...	...	...	...
Total	13	4	...	1	216	2	189	...	4	1	...	...
Tenth Ward.												
White	22	13	8	...	101	...	204	...	4	7	11	1
Colored	...	...	...	...	75	...	77	...	...	...	5	...
Total	22	13	8	...	176	...	281	...	4	7	16	1
Total White	331	459	120	13	1229	210	1351	5	36	425	45	25
Total Colored	1	3	3	...	359	62	796	...	...	15	6	...
Sum total	332	462	123	13	1588	272	2147	5	36	440	51	25

MORTUARY STATISTICS OF NASHVILLE FOR 1875.—CAUSE OF DEATH.

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MARCH. W. Male.	MARCH. W. Female.	MARCH. C. Male.	MARCH. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Abscess of Liver		1															1		1	1																													4
" Lungs																													1																			1
" Psoas															1																1																	2
Aneurism																																																	
Angino Pectoris																					1																												1
Aphtha										1	1			1							1		1	2			1	1														1						11
Apoplexy													1																	1																		2
Asthma																						1											1						1		1							4
Brain, Congest'n of																									1		2										1						1		1				8
" Disease of									1															1	2						2																	7
" Inflamt'n of	1	1	1							1		1												1									1			1	1												10
" Softening of	1																								1																								2
Burns and Scalds				1											2																								1										4
Cancer							1																				1											1				1						4
" of Breast																																																
" of Rectum																																														1			1
" of Womb																						1																											1
Carbuncle																																		1														1
Caries																																																
Child Birth																								2																								2
Chlo'f'm, Inh't'n of													1																																			1
Colic			1									1																																				2
Chlorosis													1																																			1
Cholera Morbus															1										1																								2
" Infantum														1							2	6	1	1	1		2	1	3	1	2	2		3		3												29
Craniotomy																																																
Congestion, general																						1												1	1												4
" Spin. Cord																																																
" of Lungs		1								1					1	2						2			1	1	2	1						1			1	1				1			1		2		12
Convulsions	1			1		1	2		1			2			2	1			1			2					1							1		3	1	1		1							22
" Pueperal																																						1										1
Croup		1	1		1	2	3		2											1		1		1					1		1			1		2			1		1							20
Cynanosis	1																																															1
Debility											1		1			1	1	1	1		1		1										1	1				2				2			1	1		16

MORTUARY STATISTICS OF NASHVILLE FOR 1875—CAUSE OF DEATH.

CAUSE OF DEATH.	JAN.				FEB.				MAR.				APRIL.				MAY.				JUNE.				JULY.				AUG.				SEPT.				OCT.				NOV.				DEC.				Total for year.
	W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		W.		C.		
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Mala.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
Delirium Tremens				1	1																																								1
Diptheria		2		1		1		1	1													1							3	2	4	3	12	7	6	8	4	8	9	8	6	4	4	1		1	2	1	100
Diarrhea				1												1					1	1					1						1			1				1							8
Dropsy Abdom'al																																															
Drop-y, General		1		1	1									2					2		1	1		1			1			1	1				1					1					1	17
Dropsy of Heart																			1																												1
Dropsy in Head																																				1					1					2
Dropsy of Chest	1																																1		1											4
Drowned																									2																						
Dyspepsia																																															
Dysentery	1			1						1								2	1					1	3				3	3	4	4			5		1	5	2	5		1		2			1	46
Entero Colitis																					2	2	1	2	1	1	1		1	1		1	2	1	1	2				2	1						22
Epilepsy										1																																				1
Erysipelas																																														
Fever		1																																1												1
Fever, Bilious																					1																					1					5
Fever, Congestive																																									1					1
Fever, Intermi'nt					1												1																1			1			1							5
Fever, Malarial																																											2				6
Fever, Puerpal									1								1		1			1																									
Fever, Remittent																																														
Fever, Scarlet	1	1			2		1	1		1			1	1			1				4	1		1	1				2			2		2			2				1		1				23
Fever, Typhoid		1							1	1																				1						4			1		1		1	1	1	17
Fistula in Anni																																				1										1
Gastro Enteritis																	1				1				1					1																4
Gangrene																																														
Gout																																														
Heart, Disease of	2				1	1				1			1		2							1		1					1						3	1		1				1					17
Hemorrhage					1																																									1
Hemo'ge of Lungs			1	1																											1										1				4
Hem'ge Umbilical						1																																								1
Hem'ge of Womb																																												1		1
Hernia																																														
Hernia, Strang'ed																																														1

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MARCH. W. Male.	MARCH. W. Female.	MARCH. C. Male.	MARCH. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Hip Joint, Dis. of..								1																																									1
Inflam'n of Bowels										1											2	1			1					1															1		1	10
" Bladder																																	1														1		2
" Bronchi						1													1												1														1			4
" Kidneys																																																
" Liver																																																
" Larynx																									1									1			1										4
" Lungs																											1																				1
" Mouth																																																
" Pericardium																													1																			1
" Peritorium						1				2													1	1							1																6
" Plura																																																
" Stomach																													1									1									3
" Tonsils																																																
" Womb												1						1								1						1						1							2		8
Influenza																																																
Insanity																																																
Intemperance.....																							1		1				1																		3
Intusseption.....																													1																		1
Jaundice,.....				1																			1																				1		2
Kidneys, Disase of										1																																						1
" Bright's " "																																																1
Lead Poison																							1																								
Liver, Disease of....		1			1									1					1						1				1								1		1							9
Lungs, " " ...													1					1	1		2		1	1		2							1		1										10
Marasmus																																																
Measles																																	1														1
Meningitis.....	1					1									1								1		2				1					1											8
" Cerebro Spinal	1									1																																					2
Necrosis.....															1																															1
Neglect.....																																																
Neuralgia.....																																																
Old Age.....			1		1			1				2	1			1					1	1				1		1					2	1	1	1		1				1		1		19
Ovariotomy																																																
Paralysis.....															2						1	1					1														1	3					6
Phthisis Pulmona's	1	3	3	3	1	3	2	8	1	5	4	3	3	2	1	2	2	6	2	1	1	3	2	4	4	1	1	1	2	2	3	3	5	4	2	2	7	2	4	4	1	3	3	1	1	3	1	4	2	128
Pneumonia		2	2	6	2	2	1	1	6	3	6	3	3	2	2	6	2	1	4	2				1	1	1	1	2																		1		60
" Pleuro	1																																															1

MORTUARY STATISTICS OF NASHVILLE FOR 1875. CAUSE OF DEATH.

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MAR. W. Male.	MAR. W. Female.	MAR. C. Male.	MAR. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for year.
Pneumonia, Typh'd							1						1										1																										3
Poison																	1												1	1																				4
Psosiasis										1																														1									1
Puepura																																																	
Placentia previa																																																	
Pyemia									1									1																															2
Rheumatism				1														3																									1						5
Scrofula				1							2						1	1											1													1						9
Septicemia																																																
Small-pox																																																1
Spine, Disease of													1																						1	1												3
Spina Bifida																						1																										1
Strangulation																																																
Suicide																																					1										1
Suffocation			1																																							2				3
Syphilis												1																																				1
Trismus Nasc'tium				2													1	1							1				2		1				1	1	1						1				12
Tabes Mesenterica				1														1											1						1												5
Teething			1						1	1					1			1	1				1			1	4	6	2	2	8	2	1												1	35
Tetanus							1								1							1																							1			3
Tumor Uterus																			1																													1
Uraemia																																																
Unknown					1												1																														2
Whooping Cough		3			1	1	1			1	1							8	3			1					1	4	1		1	2	1	1	1		1	1				1	1				22
Wounds				3							1						1	8	3				4	2				2	1		2	1	1		1	1						2					41
" Railroad			1					1					1			3	1	1					1	1			1	1									2				1						16
Worms	2				1								1		1										1																						2
Womb, Disease of											1																																				1
	16	19	13	25	16	15	13	14	15	20	22	14	16	10	15	21	13	9	29	24	23	26	14	24	28	8	23	22	30	19	30	27	34	26	25	36	18	31	23	20	19	15	16	14	10	6	15	13	933
Premature Births			1														1	1	1										1	1			2				1	2										11
Still Born		1		1	1		2	3	1	2	1	2	1	1	1	1	3	1	4	2	2		5		1		4	2	2		3	5	2	1	4	2		1	2	1	2	1	1	1	1	1		1	2	1	73

MORTUARY STATISTICS OF NASHVILLE FOR 1875.

Sex and Social Relations.

SEX AND SOCIAL RELATIONS.	JAN.		FEB.		MAR.		APR.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Male	16	13	16	13	15	22	16	15	13	29	23	14	28	23	30	30	34	25	18	23	19	16	10	15	238	238	476
Female	19	25	15	14	20	14	9	21	9	24	26	24	8	22	19	27	26	36	31	20	15	14	6	13	203	254	457
Total	35	38	31	27	35	36	25	36	22	53	49	38	36	45	49	57	60	61	49	43	34	30	16	28	441	492	933
Married	12	6	4	9	10	5	6	8	7	12	11	8	12	9	10	8	4	12	12	7	9	2	5	5	102	91	193
Single	19	29	12	13	34	28	15	21	12	34	30	25	23	33	36	46	52	44	32	29	22	33	10	22	297	346	643
Widow	3	2	3	4	1	3	2	4	1	4	4	4	1	2	2	2	3	3	4	5	3	5	.....	.....	27	38	65
Widower	1	1	2	1	.....	.....	2	3	2	3	4	1	.....	1	1	1	1	2	1	2	.....	1	1	1	15	17	32
Total	35	38	31	27	35	36	25	36	22	53	49	38	36	45	49	57	60	61	49	43	34	30	16	28	441	492	933

MORTUARY STATISTICS OF NASHVILLE FOR 1875—BY AGES.

AGES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Under 1	4	7	6	9	8	8	2	9	3	17	16	13	10	16	16	13	11	11	8	6	2	6	1	6	87	121	208
From 1 to 2	5	4	3	.....	8	5	2	5	2	3	7	3	3	6	5	9	13	6	5	8	2	3	1	3	56	55	111
From 2 to 3	.....	4	.....	.....	2	1	1	2	.....	4	1	2	3	2	3	5	7	6	2	4	2	1	.....	3	21	34	55
From 3 to 4	2	2	3	1	1	2	1	2	.....	2	2	1	1	4	3	4	3	7	1	1	2	3	.....	3	19	32	51
From 4 to 5	.....	1	1	.....	1	1	.....	2	.....	1	.....	.....	.....	.....	.....	4	3	3	1	1	3	1	.....	1	9	15	24
From 5 to 10	3	3	.....	2	.....	2	3	.....	.....	2	1	4	3	2	4	4	9	4	7	3	3	4	3	1	36	31	67
From 10 to 15	1	1	.....	1	.....	.....	2	.....	1	3	2	.....	.....	1	.....	1	1	3	1	1	.....	.....	.....	1	8	12	20
From 15 to 20	.....	3	2	1	1	1	2	2	2	1	2	.....	1	1	.....	2	2	1	1	1	.....	3	1	1	14	19	33
From 20 to 30	5	5	3	7	6	6	2	5	2	6	1	3	1	3	3	6	2	2	5	1	6	2	5	5	41	51	92
From 30 to 40	4	2	3	4	2	3	3	1	5	3	2	6	5	2	4	5	2	7	3	3	2	.....	2	2	37	38	75
From 40 to 50	5	1	3	.....	1	2	2	1	2	3	5	3	4	3	5	2	2	3	6	6	5	3	1	.....	41	27	68
From 50 to 60	2	.....	3	1	3	2	2	2	4	5	3	1	1	3	3	.....	1	1	3	3	6	1	2	.....	33	19	52
From 60 to 70	3	1	3	.....	2	1	1	2	1	3	4	.....	2	1	2	2	.....	5	3	3	.....	1	.....	1	21	20	41
From 70 to 80	.....	3	1	.....	.....	1	.....	1	.....	.....	2	.....	2	1	.....	.....	2	.....	3	1	1	1	.....	.....	11	8	19
From 80 to 90	.....	1	.....	1	.....	1	2	1	.....	.....	1	.....	.....	.....	1	.....	2	1	.....	.....	.....	.....	.....	.....	6	5	11
From 90 to 100	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	3
100 and upward	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	.....	.....	.....	3	3
Total	35	38	31	27	35	36	25	36	22	53	49	38	36	45	49	57	60	61	49	43	34	30	16	28	441	492	933

MORTUARY STATISTICS OF NASHVILLE FOR 1875.—NATIVITY.

NATIVITIES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Nashville, Tennessee	27	35	21	24	28	33	19	30	16	48	38	35	25	40	36	56	53	58	33	39	26	27	11	26	333	451	784
Other States	5	3	7	3	3	3	5	6	4	5	3	3	8	5	8	1	7	3	3	4	6	3	2	2	61	41	102
Ireland	1	.....	1	.....	.....	.....	1	.....	1	.....	3	.....	2	.....	4	.....	.....	.....	8	.....	.....	.....	2	.....	23	.....	23
Great Britain	1	.....	1	.....	2	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	5
Dominion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Germany	1	.....	1	.....	2	.....	.....	.....	1	.....	3	.....	.....	.....	1	.....	.....	.....	3	.....	2	.....	1	.....	15	.....	15
Italy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scandinavian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
France	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	1
Russia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	2	.....	2
Total	35	38	31	27	35	36	25	36	22	53	49	38	36	45	49	57	60	61	49	43	34	30	16	28	441	492	933

MORTUARY STATISTICS OF NASHVILLE FOR 1875.—BY WARDS.

WARDS.	JAN.		FEB.		MAR.		APR.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
First	.....	.....	2	.....	2	1	1	2	.....	2	.....	.....	1	1	.....	1	.....	5	.....	1	.....	1	.....	.....	6	14	20
Second	4	1	1	1	1	2	5	1	.....	2	4	2	1	2	1	2	3	2	2	.....	7	2	1	1	30	18	48
Third	2	.....	.....	.....	1	1	1	1	.....	.....	1	1	3	1	.....	1	.....	4	2	1	.....	1	.....	.....	10	11	21
Fourth	4	14	2	4	4	7	2	7	4	14	8	7	3	14	11	15	7	15	7	10	3	4	2	3	57	114	171
Fifth	3	3	9	2	3	2	3	2	1	.....	2	2	2	2	4	3	4	3	5	3	7	2	4	1	47	25	72
Sixth	6	2	2	9	7	10	4	4	5	15	8	10	3	11	2	21	7	10	4	4	5	4	6	4	59	104	163
Seventh	7	7	7	6	10	5	2	2	7	6	8	4	9	3	5	6	17	5	8	4	2	3	1	5	83	56	139
Eighth	6	5	3	3	2	3	2	6	1	8	3	5	8	4	9	1	7	6	4	7	1	2	.....	3	46	53	99
Ninth	1	1	1	.....	2	.....	.....	.....	1	1	8	1	.....	2	7	1	10	2	7	.....	5	1	.....	.....	42	9	51
Tenth	2	5	4	2	3	5	5	11	3	5	7	6	6	5	10	6	5	9	10	12	4	10	2	11	61	87	148
Totals	35	38	31	27	35	36	25	36	22	53	49	38	36	45	49	57	60	61	49	43	34	30	16	28	441	492	933

METEOROLOGICAL RECORD *for the Year* 1875, *kept at Nashville, Tenn. Latitude* 36° 11′, *Longitude* 86° 53′, *W. from Greenwich. Elevation of Barometer above sea level,* 504.2 *feet.*

DATE.	BAROMETER.							THERMOMETER.							WIND.						AM'T RAIN AND MELTED SNOW.		RELATIVE HUMIDITY.
	MEAN.	MEAN OF—			RANGE.			MEAN.	MEAN OF—			RANGE.			PREVAILING DIRECTION.	NUMBER OF MILES.					TOTAL.		
		A. M. observation.	P. M. observation.	Night observation.	Highest.	Lowest.	Difference.		A. M. observation.	P. M. observation.	Night observation.	Maximum.	Minimum.	Difference.		Noon to 6 P. M.	6 P. M. to midnight.	Midnight to 6 A. M.	6 A. M. to noon.	Maximum velocity during month.		Am't in inches.	No. days which rain or snow fell.	
January	30.229	30.253	30.216	30.219	30.766	29.636	1.130	33.7	29 8	37.2	33.6	60.0	2.0	62.0	N.W.	934	706	870	938	16	3,482	6.15	15	73.8
February	30.163	30.200	30.142	30.149	30.804	29.590	1.214	38.2	31.7	43.6	38.3	75.0	9.0	66.0	S. E.	981	572	695	1,168	16	3,416	3.06	12	62.6
March	30.036	30.042	30.001	30.041	30.407	29.396	1.011	49.1	43.8	54.1	48.3	74.0	24.0	50.0	S.	1,544	962	862	1,306	36	4,674	8.14	15	65.5
April	30.011	30.059	29.962	30.005	30.280	29.703	0.577	56.3	49.5	63.2	54.7	80.0	25.5	54.5	N.W.	1,472	777	565	1,042	20	3,856	4.25	13	55.4
May	29.971	30.016	29.921	29.978	30.327	29.390	0.937	68.3	63.7	75.7	65.5	89.0	40.0	49.0	S.	1,455	708	561	1,162	28	3,894	1.73	10	57.1
June	29.997	30.029	29.952	29.999	30.190	29.821	0.369	76.9	74.3	82.9	74.0	92.0	53.0	39.0	S.	1,178	551	443	968	13	3,140	5.63	13	66.8
July	29.988	30.018	29.955	29.988	30.181	29.788	0.393	81.3	78.8	86.2	78.5	97.0	66.0	31.0	S. W.	1,016	449	298	798	12	2,561	8.12	16	73.6
August	29.974	30.002	29.937	29.976	30.186	29.727	0.459	74.0	68.8	81.5	71.5	89.0	57.0	32.0	N.W.	882	400	276	605	12	2.163	1.60	10	72.1
September	30.032	30.071	29.988	30.036	30.278	29.642	0.636	69.2	63.6	76.3	67.(	93.0	41.0	52.0	N.W.	872	444	342	658	14	2,316	3.79	5	69.8
October	30.069	30.110	30.031	30.070	30.397	29.738	0.659	56.4	48.1	64.8	54.7	80.0	32.0	48.0	S.	974	518	596	1,176	17	3,264	1.25	7	61.7
November	30.036	30.076	30.006	30.037	30.519	29.638	0.881	50.4	45.2	55.9	49.7	75.0	23.0	52.0	N.	1,004	754	727	922	14	3,408	5.46	16	66.5
December	30.003	30.032	29.976	30.012	30.404	29.474	0.930	49.2	45.0	53.5	68.5	73.0	12.0	61.0	S. E.	1,119	833	693	1,024	15	3,669	4.30	11	70.1
Totals																13,431	7,674	6,928	11,767		39,843	53.48	143	
Annual Means	30.041	30.075	30.007	30.042	30.394	29.628	0.766	58.5	53.5	64.5	57.0	81.4	31.7	49 7	S.					17.7				62.1

JANUARY.—Lowest temperature since the station was established (1870).
FEBRUARY.—Two considerable rises in the Cumberland river.
MARCH.—Excess of rainfall and unusually cool weather. Vegetation about ten days later than usual.
APRIL.—Normal amount of rainfall and generally good weather.
MAY.—Continued low temperature and a slight deficienty in amount of rainfall.
JUNE.—Excess of rainfall and low temperature.
JULY.—Rainfall in excess. Crops injured by continued rain, and river higher than for years at this season.
AUGUST.—Remarkably low temperature—mist and fog frequent. Known as "the cold August."
SEPTEMBER.—Very fine weather during most of the month.
OCTOBER.—Very fine weather.
NOVEMBER.—Rainfall slightly in excess.
DECEMBER.—Unnsually high temperature during the month.

A. C. FORD, *Observer.*

MORTUARY STATISTICS OF NASHVILLE FOR 1875.—CAUSE OF DEATH.

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MAR. W. Male.	MAR. W. Female.	MAR. C. Male.	MAR. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Abscess														1																												1						3
Abscess of Liver	1																								2																								3
Abscess of Lungs																																																	
Abscess Psoas							1																																										1
Aneurism																																																	
Anginis Pectoris										1																																							1
Aphtha	1	1						2				1															2				1																	9
Apoplexy																									1								1			1												2
Asthma																							1																				1					2
Brain, Congestion of									1				1	1											2		1							1					1	1							9
Brain, Disease of		1	1						1			1	1	1	2							1		1								1						1									10
Brain, Inflam. of									1		1																		1	1																		4
Brain, Softening of										1											1		1																										3
Burns and Scalds								1																																		1						3
Cancer								1									1					1											1										1					5
Cancer of Breast		1																																														1
Cancer of Rectum																																													1				1
Cancer of Womb										1																																							1
Carbuncle																																			1													1
Caries																																																
Child-Birth																																													2				2
Chloroform, Inh. of																		1																															1
Colic																																																
Chlorosis																																																
Cholera Morbus																									1				1																			2
Cholera Infantum																					4	4		1	3	1	4	3	1		2	1															24
Craniotomy																					1																												1
Congestion		1											1																				1	2													5
Coug'tn Spinal Cord	1																																															1
Congest'n of Lungs	1													1			1			1																	2	1			1							9
Convulsions		1		1		1	1	2			3	2		2	4	2		5	5		1	1	3	1	1		5	2			1	2			2		2	2		2		1				2	52
Convul. Puerperal																						1																			1						2
Croup			4	2					2			1																	2	1	1		1		1	1	2			1	1			1			20
Cyanosis																																																1

CAUSE OF DEATH.	JAN.		FEB.		MAR.		APRIL.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total for Year.
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	
Male.																									1
Female.																									
Male.	1																								98
Female.																									
Male.			1	1	1	2					1	2													8
Female.					1	1			1		2		1		2		3	1	8	2	6	12	2	16	
Male.							1																1	1	27
Female.	1	3		1	1	2	1	1	2	1	1	1	1	3			1	1	3			1			
Male.													1	1											2
Female.													1												1
Male.																									1
Female.																									3
Male.									2										1						1
Female.																									
Male.		2		1							1		3		2	5	1	1	2	3					38
Female.			1	1	1		1			1	2	2	2	2	2	5	1	3	2						
Male.								1				1													1
Female.							1														1				1
Male.																									1
Female.																									
Male.		1														1			1						13
Female.													1		1										
Male.				1		1			1												1				4
Female.																									1
Male.					1						1														5
Female.	1								1							1			1						
Male.						1		1			1		1				1				1				7
Female.							1		1						1				1		2				
Male.				1						2	1		1		1						1				6
Female.																1	1								1
Male.																									8
Female.									1						1	1	1				1		1		1
Male.																									22
Female.	1		1		1		2	1		1	1		1	1			1		1	1	1		1	1	
Male.							1																		2
Female.			1			1												1		1					3
Male.		1																							1
Female.																									1
Male.																									2
Female.					1								1				1								1
Male.													1	3		1			1		1				
Female.																									

MORTUARY STATISTICS OF NASHVILLE FOR 1876—CAUSE OF DEATH.

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MAR. W. Male.	MAR. W. Female.	MAR. C. Male.	MAR. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for year.
Inflam'n Bladder																															1																		2
" Bronchi																																									1							2
" Kidneys																											1																					
" Liver																																																	
" Larynx																																																	
" Lungs																																																	
" Mouth																																																	
" Pericardium														1																																	1		2
" Peritonium																															1																		1
" Pluro																																																	
" Stomach									1				1																1																			5
" Tonsils																																																	
" Womb																			1																															1
Influenza			1				1				2																														1							6
Insanity																																																	
Intemperance																										1																							1
Intussusception																						1																							1				2
Jaundice																																															1		1
Kidneys, Disase of																										1								1														2
" Bright's " "																			1																														1
Lead Poison																																																	6
Liver, Disease of																											1		1						1														3
Lungs, " "														1															1	1																		13
Marasmus					1				2		2		1	3	1	1	4		1	2	1	4	1	2	2	1	1	2	1	1	2		1	1		2		1									38
Measles																																																	5
Meningitis		1		1																			1																									2
" Cereb. Spinal		1																	1																														
Necrosis																																																	
Neglect																																																	6
Neuralgia														1																																			1
Old Age				2		3		1		1				4		2		2		1		2		1				1				1		2				1		1	1	1	1			2		30
Ovariotomy																			1																														1
Paralysis		1									1					1		1	1			1																							2		1		12
Phthisis Pulmon's	1	7	1	5	4	1		2	4	2	1	3	3	6	1	5	3	3	3	2		3	2	3		3	1	4	2	2		3	1	2	1	1	4	2	4	1	1	3	1	5	2	1		2	113

Cause of Death.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MARCH. W. Male.	MARCH. W. Female.	MARCH. C. Male.	MARCH. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Pneumonia		2	2	1	2	2		2		1	4	1	4	2	6	4	1	2	2	4		1						2									1			1		2	3	1	5	62
" Pleuro																																													1			1
" Typhoid																																	1					1						1	1		4
Poison																																															
Psosiasis																																															
Purpura																																															
Placentia previa				1																																											1
Pyemia																																							1								1
Rheumatism																			1																							1				2
Scrofula	1			2			1						1		2				1	1		1	1					2														1				14
Septicemia																									1													1								2
Small-pox																																															
Spine, Disease of												1													1		1			1															1	5
Spina Bifida																																															
Strangulation																																															
Suicide	1																				1																1								3
Suffocation	2																																														2
Syphilis								1						1																																	1
Sun Stroke																									1	1																				2
Trismus Nasc'tium						1															1			2								1											1			2
Tabes Mesenterica							1				1								1						1	1	4	6	1	2	1							1							4
Teething				2			1	1							1						2	1	2	4	1	1					1												1	1	33
Tetanus																									1																				2
Tumor Uterus						1																																								1
Ulcer of Leg																																														1
Unknown		2	1		1	1		1		1	3	1	1		1	2			1	1	1			1					1						1			1					1		23
Whooping Cough										1	1		1			1																		1											9
Wounds	1			1									1							1													1		1		2			1					5
" Railroad	1								1																															1						3
Worms																																										1				1
Womb, Disease of												1																																			1
Totals	14	21	15	22	9	13	8	16	16	13	19	21	19	28	21	20	13	13	21	22	19	27	14	23	27	13	29	34	17	12	19	21	15	15	9	18	24	26	16	20	25	24	9	15	16	31	18	19	899
Premature Births																						2	1					1			1		1	2				1		1			1						9
Still Born			1			1	1														2	1	2	1			1	1			3	2	1	1	2	2		1		2	1	1			1		1	2		28

MORTUARY STATISTICS OF NASHVILLE FOR 1876.

Sex and Social Relations.

SEX AND SOCIAL RELATIONS.	JAN.		FEB.		MAR.		APRIL.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Male	14	15	9	8	16	19	19	21	13	21	19	14	27	29	17	19	15	9	24	16	25	9	16	18	214	198	412
Female	21	22	13	16	13	21	28	22	13	22	27	23	13	34	12	21	15	18	26	20	24	15	20	19	236	251	487
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	36	39	450	449	899
Married	9	8	5	1	10	6	9	41	26	8	6	6	8	8	5	7	9	2	11	16	10	4	10	4	100	74	174
Single	22	21	12	17	15	29	32	4	8	28	35	27	28	52	20	27	16	20	37	14	34	16	33	29	297	313	610
Widow	3	8	3	6	4	3	4	33	12	5	4	3	3	2	2	4	4	4	1	5	2	3	2	3	37	50	87
Widower	1		2			2	2	4	5	2	1	1		1	2	2	1	1	1	1	3	1	2	1	16	12	28
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876—BY AGES.

AGES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Under 1	7	9	5	7	5	19	7	10	7	10	20	10	9	21	5	6	3	6	6	8	7	3	3	10	84	119	203
From 1 to 2	3	3	.....	4	3	.....	3	4	2	2	4	4	3	8	6	8	2	2	4	2	2	2	6	2	38	41	79
From 2 to 3	.....	1	1	2	2	2	3	3	.....	4	5	4	3	10	3	5	2	.....	5	2	6	.....	6	2	36	35	71
From 3 to 4	.....	2	.....	.....	1	1	3	2	.....	1	1	3	1	3	1	2	1	1	5	.....	4	2	2	.....	19	17	36
From 4 to 5	.....	.....	1	.....	1	1	1	1	.....	1	.....	3	.....	.....	.....	2	2	2	9	.....	.....	2	2	5	18	17	35
From 5 to 10	1	3	.....	.....	.....	.....	2	1	2	1	1	1	2	.....	.....	1	2	2	5	3	8	4	8	1	30	24	54
From 10 to 15	1	.....	.....	.....	.....	1	.....	2	.....	2	1	2	1	1	.....	.....	2	1	.....	.....	1	1	1	2	7	12	19
From 15 to 20	2	3	1	3	2	2	2	4	1	4	1	.....	2	2	1	2	.....	1	.....	2	1	.....	.....	.....	13	23	36
From 20 to 30	9	3	2	2	3	5	6	2	2	3	3	2	2	4	3	2	1	7	3	4	4	3	3	4	41	41	82
From 30 to 40	4	3	3	1	2	3	2	2	4	3	3	.....	6	4	2	2	2	1	2	5	4	4	5	2	40	30	70
From 40 to 50	2	4	.....	1	4	2	6	3	2	5	2	3	5	.....	4	2	6	.....	3	5	4	2	2	1	40	28	68
From 50 to 60	3	3	4	2	1	3	3	4	4	4	1	.....	1	1	1	.....	4	1	2	3	3	.....	3	3	30	25	55
From 60 to 70	3	2	3	1	3	1	4	1	1	.....	.....	2	4	1	3	1	2	1	4	.....	2	.....	3	3	32	17	49
From 70 to 80	.....	.....	2	1	1	.....	.....	.....	.....	2	2	3	.....	.....	.....	.....	.....	1	2	1	2	1	2	2	12	13	25
From 80 to 90	.....	1	.....	.....	.....	.....	4	.....	1	1	1	.....	.....	1	.....	.....	.....	.....	.....	1	1	.....	1	.....	7	4	11
From 90 to 100	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	2	4
100 and upward	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876.—NATIVITY.

NATIVITIES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Nashville, Tennessee	28	32	17	22	22	38	30	40	18	40	35	33	28	61	22	35	14	22	33	35	35	24	38	33	320	415	735
Other States	3	5	5	2	6	2	7	1	2	3	10	4	7	2	6	5	8	5	10	1	9	.....	7	4	80	34	114
Ireland	3	.....	.....	.....	.....	.....	3	.....	4	.....	1	.....	3	.....	.....	.....	7	.....	3	.....	4	.....	.....	.....	28	.....	28
Great Britain	.....	.....	.....	.....	.....	.....	3	.....	1	.....	.....	.....	1	.....	1	.....	1	.....	3	.....	1	.....	1	.....	11	.....	11
Dominion	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Germany	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	5	.....	5
Italy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	3
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Scandinavian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	49	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876.—BY WARDS.

WARDS.	JAN.		FEB.		MAR.		APR.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
First	.....	2	1	1	.....	.....	5	1	3	1	1	1	2	1	2	2	1	.....	1	4	4	....	4	2	24	15	39
Second	2	3	1	1	3	3	3	3	1	4	4	1	5	6	1	4	.....	4	6	5	2	1	2	3	30	38	68
Third	1	2	.....	.....	2	.....	.....	1	2	2	1	1	2	2	2	1	3	3	5	3	1	2	5	1	24	18	42
Fourth	1	9	1	7	1	9	2	12	2	7	5	8	4	10	2	4	5	3	1	4	6	7	4	10	34	90	124
Fifth	4	1	1	2	5	3	3	1	.....	4	2	1	6	2	5	4	7	3	2	4	3	.....	4	2	36	27	63
Sixth	8	9	2	6	6	8	7	6	5	10	9	10	5	13	4	12	8	5	7	5	6	3	6	8	73	95	168
Seventh	6	3	4	3	5	5	6	3	5	1	9	1	6	9	5	5	4	3	9	3	6	5	4	4	69	45	114
Eighth	7	3	8	3	2	3	9	5	5	3	2	3	8	4	3	.....	2	.....	6	3	8	2	8	4	68	33	101
Ninth	1	.....	1	.....	2	.....	4	1	2	1	5	4	1	3	2	1	2	1	10	3	6	2	7	2	43	18	61
Tenth	5	5	3	1	3	9	8	8	1	10	8	7	1	13	3	7	4	5	3	2	7	2	3	1	49	70	119
Totals	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

METEOROLOGICAL RECORD *for the Year* 1876, *kept at Nashville, Tenn. Latitude* 36° 11′, *Longitude* 86° 53′, *W. from Greenwich. Elevation of Barometer above sea level,* 504.2 *feet.*

DATE.	BAROMETER.							THERMOMETER.							WIND.							AM'T RAIN AND MELTED SNOW.		RELATIVE HUMIDITY.
		MEAN OF—			RANGE.				MEAN OF—			RANGE.				NUMBER OF MILES.								
	MEAN.	A. M. observation.	P. M. observation.	Night observation.	Highest.	Lowest.	Difference.	MEAN.	A. M. observation.	P. M. observation.	Night observation.	Maximum.	Minimum.	Difference.	PREVAILING DIRECTION.	Noon to 6 P. M.	6 P. M. to midnight.	Midnight to 6 A. M.	6 A. M. to noon.	Maximum velocity during month.	TOTAL.	Am'nt in inches.	No. days which rain or snow fell.	
January	30.197	30.234	30 163	30.201	30.609	39.628	0 981	47.3	42.2	52.9	46.6	73.0	17.0	56.0	S.	1,268	895	895	1,152	22	4,210	6 41	10	66.8
February	30.137	30.181	30.095	30.147	30.640	29.552	1.087	46.2	40.2	52 9	45.0	73.0	9.0	64.0	S.	1,225	822	639	901	28	3.588	2.22	5	63.7
March	30.018	30.041	29.983	30 016	30 501	29.385	1.119	46.6	40.7	52.0	46 0	76 0	14.0	62.0	W.	1,574	1,020	896	1,220	24	4,710	5.28	11	59.9
April	30 011	30.048	29.972	30.001	30 332	29.636	0.696	60.5	54 6	67 1	58.8	80.0	37.0	43.0	S.	1,223	653	475	956	14	3,307	3.62	9	54 3
May	29.994	30.030	29.955	29.991	30.205	29.733	0.472	70 3	65.6	76.3	68.3	90.0	42.0	48.0	S	1,173	558	456	983	16	3,170	3.40	11	61.3
June	29.942	29.967	29.903	29 945	30.122	29 659	0.463	76.5	73.5	82.8	73 6	94.0	58.0	36 0	S.	1,174	497	364	900	14	2,935	5.65	14	65.7
July	29.996	30.023	29.957	30 002	30 139	29 809	0.330	80.9	78.8	85.9	77 6	97.0	58.0	39.0	W.	1.078	444	269	778	16	2,569	7.15	11	68.1
August	30 008	30.033	29.969	30 008	30.183	29.807	0 376	78.7	75.5	84.1	76 2	95.0	60.0	35.0	E.	1,005	352	244	678	20	2.279	5.77	14	73.5
September	29.976	30 007	29.934	29 985	30.201	29.699	0.502	69 2	63.7	76.7	66 4	91 0	42.0	49.0	N.W.	901	341	260	714	12	3,216	2.52	5	68.4
October	30.029	30.076	29.980	30.033	30.385	29.589	0.796	56.7	49 3	65.7	54.1	80.0	29 0	51.0	N.W.	1,120	547	460	896	18	3,023	2.68	7	63.4
November	30.039	30 068	30 001	30 047	30.328	29.611	0.717	46.4	41.7	51.7	44.8	77.0	23.0	54 0	N.W.	967	632	674	835	16	3,108	1.26	9	67.7
December	30.154	30.196	30.123	30.154	30.528	29.627	0.901	30.8	24.0	36.1	30.5	64.0	—.2	66.0	W.	907	525	519	699	14	2,648	0.95	9	66.6
Totals																13,615	7,286	6,145	10,713		37,763	46.91	115	
Annual Means	30.041	30.975	30.002	30 644	30.347	29.644	0.703	59.1	54.1	65.3	57 3	82.5	32.2	50.2	W.	1,134	607	512	892	17	3,146	3.90	9.5	64.9

JANUARY.—Very warm weather. Peach-trees bloom on the 29th.
FEBRUARY.—Warm pleasant weather. Fruit-trees continue to bloom and bud.
MARCH.—Changeable and disagreeable. Heavy snow storm on the 20th.
APRIL.—Warmest month of the name since 1872.
MAY.—Noticeable absence of thunder and lightning during rain. Fine weather for vegetation.
JUNE.—Frequent thunder showers. Very seasonable weather.
JULY.—Rainfall in excess. Dangerous floods in small streams.
AUGUST.—Frequent thunder storms and heavy rains. Lunar Rainbow on the 6th, 10:30 P.M.
SEPTEMBER.—Fair weather.
OCTOBER.—Very fine. Mostly Indian Summer.
NOVEMBER.—Clear dry weather, with heavy fogs.
DECEMBER.—Low temperature, dry weather, and heavy snow storms. Cumberland River frozen over on 31st.

A. C. FORD, *Observer.*

DEATH RATES IN CITIES IN THE UNITED STATES DURING THE YEAR 1876.

(TAKEN FROM THE RICHMOND, VA., REPORT FOR 1876.)

CITIES.	STATES.	Estimated present Population.	Deaths in 1876.	Death Rate per 1000 Inhabitants.
New York	New York	1,070,276	29,152	27.23
Philadelphia	Pennsylvania	825,594	18,892	22.88
Brooklyn	New York	506,223	12,304	24.30
St. Louis	Missouri	501,489	7,890	15.73
Chicago	Illsnois	420,000	8,680	20.66
Baltimore	Maryland	350,000	7,382	21.09
Boston	Massachusetts	341,919	8,199	23.97
San Francisco	California	300,000	5,669	18.31
Cincinnati	Ohio	265,000	5,710	21.54
Cleveland	Ohio	161,000	3,089	19.18
Hudson County	New Jersey	166,887	4,318	25.87
Washington	District of Columbia	160,000	4,234	26.46
Louisville	Kentucky	160,000	2,775	17.34
Pittsburgh	Pennsylvania	142,000	2,896	20.39
Providence	Rhode Island	101,500	1,864	18.36
Milwaukee	Wisconsin	100,781	2,084	20.67
Richmond	Virginia	75,000	1,649	21.98
Charleston	South Carolina	56,540	1,865	32.98
New Haven	Connecticut	60,000	1,232	20.53
Toledo	Ohio	50,000	740	14.80
Memphis	Tennessee	50,000	1,253	25.06
Cambridge	Massachusetts	50,000	966	19.31
Lowell	"	50,000	1,147	22.94
Worcester	"	50,000	1,127	22.54
Fall River	"	46,000	1,110	24.13
Reading	Pennsylvania	40,109	990	24.40
Mobile	Alabama	40,000	1,120	28.00
Evansville	Indiana	40,000	708	17.70
Patterson	New Jersey	38,875	1,066	27.42
Dayton	Ohio	36,000	521	14.47
Lawrence	Massachusetts	36,000	845	23.47
Quincy	Illinois	35,181	585	16.62
Minneapolis	Minnesota	35,000	457	13.05
Lynn	Massachusetts	32,600	718	22.02
Utica	New York	32,070	559	17.43
Grand Rapids	Michigan	32,000	388	12.12
Springfield	Massachusetts	30,000	631	21.03
Peoria	Illinois	30,000	434	14.46
Harrisburg	Pennsylvania	30,000	488	16.25
Nashville	Tennessee	27,000	904	33.48
Erie	Pennsylvania	26,037	350	13.44
Salem	Massachusetts	26,000	608	23.38
Salt Lake	Utah	25,000	386	15.44
Wheeling	West Virginia	28,000	611	21 35
New Bedford	Massachusetts	25,876	596	23.03
Sacramento	California	24,000	349	14.54
Norfolk	Virginia	23,500	502	21.36
Elmira	New York	20,538	305	14.85
Denver	Colorado	20,000	197	9.85
Wilmington	North Carolina	20,000	270	13.50
Petersburg	Virginia	20,000	569	28.45
Poughkeepsie	New York	19,900	335	16.83
Allentown	Pennsylvania	18,000	358	19.88
Yonkers	New York	17,500	381	21 77
Newburgh	New York	17,500	349	19.94
Norwich	Connecticut	17,500	445	25.42

MORTUARY STATISTICS OF NASHVILLE FOR 1876—CAUSE OF DEATH.

Cause of Death.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MAR. W. Male.	MAR. W. Female.	MAR. C. Male.	MAR. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Mala.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for year.
Inflam'n Bladder																														1								1									2
" Bronchi																																								1							2
" Kidneys																											1																				
" Liver																																																
" Larynx																																															
" Lungs																																															
" Mouth																																															
" Pericardium														1																															1		2
" Peritonium																															1														1		1
" Pluro																																															
" Stomach									1				1																	1												1			1		5
" Tonsils																																															
" Womb																				1																											1
Influenza			1				1				2																																			1	6
Insanity																																															
Intemperance																										1																					1
Intussusception																							1																				1				2
Jaundice																																												1			1
Kidneys, Disase of																									1								1													2
" Bright's " "																																															
Lead Poison																			1																												1
Liver, Disease of																											1		1					1							2			1		6
Lungs, " "														1															1	1													1			3
Marasmus					1				2		2		1			1		1		2			1	2	1	2		1	1	2							1				1					13
Measles										2		1	1	3	1	1	4		2	2	1	4	1	2		2	3	1		2		1			2								1			38
Meningitis		1		1																			1					1																		5
" Cereb. Spinal		1																		1																										2
Necrosis																																															
Neglect																																		1					2						3	6
Neuralgia														1																																	1
Old Age				2		3		1		1				4		2		2		1		2		1				1				1		2						1		1	1	1	1		2	30
Ovariotomy																				1																										1
Paralysis		1										1				1		1		1		1		1																				2		1	12
Phthisis Pulmon's	1	7	1	5	4	1		2	4	2	1	3	3	6	1	5	3	3	3	2		3	2	3		3	1	4	2	2		3	1	2	1	1	4	2	4	1	1	3	1	5	2	1		2	113

Cause of Death.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MARCH. W. Male.	MARCH. W. Female.	MARCH. C. Male.	MARCH. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Pneumonia		2	2	1	2	2		2		1	4	1	4	2	6	4	1	2	2	4		1						2									1		2		2	3		5	62
" Pleuro																																												1		1
" Typhoid																																	1			1							1	1		4
Poison																																														
Psosiasis																																														
Purpura																																														
Placentia previa				1																																										1
Pyemia																																							1						1
Rheumatism																			1																						1				2
Scrofula	1			2			1						1		2				1	1		1	1					2													1				14
Septicemia																									1												1								2
Small-pox																																														
Spine, Disease of												1													1		1		1															1	5
Spina Bifida																																														
Strangulation																																														
Suicide	1																				1																1								3
Suffocation	2							1						1																															2
Syphilis																									1	1																			2
Sun Stroke																							2																						2
Trismus Nasc'tium						1															1							1													1		1		2
Tabes Mesenterica							1				1									1																									4
Teething				2			1	1							1						2	1	2	4	1	1	4	6	1	2	1	1	1									1	1	33
Tetanus																									1						1													2
Tumor Uterus						1																																							1
Ulcer of Leg																																													1
Unknown		2	1		1	1		1		1	3	1	1		1	2			1	1	1			1					1						1				1				1	23
Whooping Cough										1	1		1			1																			1									2
Wounds	1			1									1							1													1			2			1					5
" Railroad	1									1																														1					3
Worms																																											1		1
Womb, Disease of												1																																		1
Totals	14	21	15	22	9	13	8	16	16	13	19	21	19	28	21	20	13	13	21	22	19	27	14	23	27	13	29	34	17	12	19	21	15	15	9	18	24	26	16	20	25	24	9	15	16	31	18	19	899
Premature Births																							1					1		1			1		2			1		2	1		1					9
Still Born			1			1	1														2	1	2	1			1	1			3	2	1	2	2		1			1	1		1	1		1	2	28

MORTUARY STATISTICS OF NASHVILLE FOR 1876.

Sex and Social Relations.

SEX AND SOCIAL RELATIONS.	JAN.		FEB.		MAR.		APRIL.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Male	14	15	9	8	16	19	19	21	13	21	19	14	27	29	17	19	15	9	24	16	25	9	16	18	214	198	412
Female	21	22	13	16	13	21	28	22	13	22	27	23	13	34	12	21	15	18	26	20	24	15	20	19	236	251	487
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	36	39	450	449	899
Married	9	8	5	1	10	6	9	41	26	8	6	6	8	8	5	7	9	2	11	16	10	4	10	4	100	74	174
Single	22	21	12	17	15	29	32	4	8	28	35	27	29	52	20	27	16	20	37	14	34	16	33	29	297	313	610
Widow	3	8	3	6	4	3	4	33	12	5	4	3	3	2	2	4	4	4	1	5	2	3	2	3	37	50	87
Widower	1		2			2	2	4	5	2	1	1		1	2	2	1	1	1	1	3	1	2	1	16	12	28
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876—BY AGES.

AGES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Under 1	7	9	5	7	5	19	7	10	7	10	20	10	9	21	5	6	3	6	6	8	7	3	3	10	84	119	203
From 1 to 2	3	3	.....	4	3	.....	3	4	2	2	4	4	3	8	6	8	2	2	4	2	2	2	6	2	38	41	79
From 2 to 3	.....	1	1	2	2	2	3	3	.....	4	5	4	3	10	3	5	2	.....	5	2	6	.....	6	2	36	35	71
From 3 to 4	.....	2	.....	.....	1	1	3	2	.....	1	1	3	1	3	1	2	1	1	5	.....	4	2	2	.....	19	17	36
From 4 to 5	.....	.....	1	.....	1	1	1	1	.....	1	.....	3	2	.....	.....	2	2	2	9	.....	.....	2	2	5	18	17	35
From 5 to 10	1	3	.....	.....	.....	.....	2	1	2	1	1	1	1	7	.....	1	2	2	5	3	8	4	8	1	30	24	54
From 10 to 15	1	.....	.....	.....	.....	1	.....	2	.....	2	1	2	1	1	.....	.....	2	1	.....	.....	1	1	1	2	7	12	19
From 15 to 20	2	3	1	3	2	2	2	4	1	4	1	.....	2	2	1	2	.....	1	.....	2	1	.....	.....	.....	13	23	36
From 20 to 30	9	3	2	2	3	5	6	2	2	3	3	2	2	4	3	2	1	7	3	4	4	3	3	4	41	41	82
From 30 to 40	4	3	3	1	2	3	2	2	4	3	3	.....	6	4	2	2	2	1	2	5	4	4	5	2	40	30	70
From 40 to 50	2	4	.....	1	4	2	6	3	2	5	2	3	5	.....	4	2	6	.....	3	5	4	2	2	1	40	28	68
From 50 to 60	3	3	4	2	1	3	3	4	4	4	1	.....	1	1	1	1	4	1	2	3	3	.....	3	3	30	25	55
From 60 to 70	3	2	3	1	3	1	4	1	1	.....	.....	2	4	1	3	5	2	1	4	.....	2	.....	3	3	32	17	49
From 70 to 80	.....	.....	2	1	1	.....	.....	.....	.....	2	2	3	.....	.....	.....	2	1	1	2	1	2	1	2	2	12	13	25
From 80 to 90	.....	1	.....	.....	.....	.....	4	.....	1	1	1	.....	.....	1	.....	.....	.....	.....	.....	1	1	.....	1	.....	7	4	11
From 90 to 100	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	2	4
100 and upward	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876.—NATIVITY.

NATIVITIES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Nashville, Tennessee	28	32	17	22	22	38	30	40	18	40	35	33	28	61	22	35	14	22	33	35	35	24	38	33	320	415	735
Other States	3	5	5	2	6	2	7	1	2	3	10	4	7	2	6	5	8	5	10	1	9	.....	7	4	80	34	114
Ireland	3	.....	.....	.....	.....	.....	3	.....	4	.....	1	.....	3	.....	.....	.....	7	.....	3	.....	4	.....	.....	.....	28	.....	28
Great Britain	.....	.....	.....	.....	.....	.....	3	.....	1	.....	.....	.....	1	.....	1	.....	1	.....	2	.....	1	.....	1	.....	11	.....	11
Dominion	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Germany	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	5	.....	5
Italy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	3
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Scandinavian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	49	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876.—BY WARDS.

WARDS.	JAN.		FEB.		MAR.		APR.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
First	.....	2	1	1	.....	.....	5	1	3	1	1	1	2	1	2	2	1	.....	1	4	4	.....	4	2	24	15	39
Second	2	3	1	1	3	3	3	3	1	4	1	1	5	6	1	4	.....	4	6	5	2	1	2	3	30	38	68
Third	1	2	.....	.....	2	.....	.....	1	2	2	1	1	2	2	2	1	3	3	5	3	1	2	5	1	24	18	42
Fourth	1	9	1	7	1	9	2	12	2	7	5	8	4	10	2	4	5	3	1	4	6	7	4	10	34	90	124
Fifth	4	1	1	2	5	3	3	1	.....	4	2	1	6	2	5	4	7	3	2	4	3	.....	4	2	36	27	63
Sixth	8	9	2	6	6	8	7	6	5	10	9	10	5	13	4	12	8	5	7	5	6	3	6	8	73	95	168
Seventh	6	3	4	3	5	5	6	3	5	1	9	1	6	9	5	5	4	3	9	3	6	5	4	4	69	45	114
Eighth	7	3	8	3	2	3	9	5	5	3	2	3	8	4	3	.....	2	.....	6	3	8	2	8	4	68	33	101
Ninth	1	.....	1	.....	2	.....	4	1	2	1	5	4	1	3	2	1	2	1	10	3	6	2	7	2	43	18	61
Tenth	5	5	3	1	3	9	8	8	1	10	8	7	1	13	3	7	4	5	3	2	7	2	3	1	49	70	119
Totals	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

METEOROLOGICAL RECORD *for the Year* 1876, *kept at Nashville, Tenn. Latitude* 36° 11′, *Longitude* 86° 53′, *W. from Greenwich. Elevation of Barometer above sea level,* 504.2 *feet.*

DATE.	BAROMETER.							THERMOMETER.							WIND.						AM'T RAIN AND MELTED SNOW.		RELATIVE HUMIDITY.
		MEAN OF—			RANGE.				MEAN OF—			RANGE.				NUMBER OF MILES.							
	MEAN.	A. M. observation.	P. M. observation.	Night observation.	Highest.	Lowest.	Difference.	MEAN.	A. M. observation.	P. M. observation.	Night observation.	Maximum.	Minimum.	Difference.	PREVAILING DIRECTION.	Noon to 6 P. M.	6 P. M. to midnight.	Midnight to 6 A. M.	6 A. M. to noon.	Maximum velocity during month.	TOTAL.	Am'nt in inches.	No. days which rain or snow fell.	
January	30.197	30.234	30 163	30.201	30.609	39.628	0 981	47.3	42.2	52.9	46.6	73.0	17.0	56.0	S.	1,268	895	895	1,152	22	4,210	6 41	10	66.8
February	30.137	30.181	30.095	30.147	30.640	29.552	1,087	46.2	40.2	52 9	45.0	73.0	9.0	64.0	S.	1,225	822	639	901	28	3,588	2.22	5	63.7
March	30.018	30.041	29.983	30 016	30 501	29.385	1.119	46.6	40.7	52.0	46 0	76 0	14.0	62.0	W.	1,574	1,020	896	1,220	24	4,710	5.28	11	59.9
April	30 011	30.048	29.972	30.001	30 332	29.636	0.696	60.5	54 6	67 1	58.8	80.0	37.0	43.0	S.	1,223	653	475	956	14	3,307	3.62	9	54 3
May	29.994	30.030	29.955	29.991	30.205	29.733	0.472	70 3	65.6	76.3	68.3	90.0	42.0	48.0	S	1,173	558	456	983	16	3,170	3.40	11	61.3
June	29.942	29.967	29.903	29 945	30.122	29 659	0.463	76.5	73.5	82.8	73 6	94.0	58.0	36 0	S.	1,174	497	364	900	14	2,935	5.65	14	65.7
July	29.996	30.023	29.957	30 002	30.139	29.809	0.330	80.9	78.8	85.9	77 6	97.0	58.0	39.0	W.	1,078	444	269	778	16	2,569	7 15	11	68.1
August	30 008	30.033	29.969	30 008	30.183	29.807	0 376	78.7	75.5	84.1	76 2	95.0	60.0	35.0	E.	1,005	352	244	678	20	2,279	5.77	14	73.5
September	29.976	30 007	29.934	29 985	30.201	29.699	0.502	69 2	63.7	76.7	66 4	91 0	42.0	49.0	N.W.	901	341	260	714	12	3,216	2.52	5	68.4
October	30.029	30.076	29.980	30.033	30.385	29.589	0.796	56.7	49 3	65.7	54.1	80.0	29 0	51.0	N.W.	1,120	547	460	896	18	3,023	2.68	7	63.4
November	30.039	30 068	30 001	30 047	30.328	29.611	0.717	46.4	41.7	51.7	44.8	77.0	23.0	54 0	N.W.	967	632	674	835	16	3,108	1.26	9	67.7
December	30.154	30.196	30.123	30.154	30.528	29.627	0.901	30.8	24.0	36.1	30.5	64.0	—.2	66.0	W.	907	525	519	699	14	2,648	0.95	9	66.6
Totals																13,615	7,286	6,145	10,713		37,763	46.91	115	
Annual Means	30.041	30.975	30.002	30 644	30.347	29.644	0.703	59.1	54.1	65.3	57 3	82.5	32.2	50.2	W.	1,134	607	512	892	17	3,146	3.90	9.5	64.9

JANUARY.—Very warm weather. Peach-trees bloom on the 29th.
FEBRUARY.—Warm pleasant weather. Fruit-trees continue to bloom and bud.
MARCH.—Changeable and disagreeable. Heavy snow storm on the 20th.
APRIL.—Warmest month of the name since 1872.
MAY.—Noticeable absence of thunder and lightning during rain. Fine weather for vegetation.
JUNE.—Frequent thunder showers. Very seasonable weather.
JULY.—Rainfall in excess. Dangerous floods in small streams.
AUGUST.—Frequent thunder storms and heavy rains. Lunar Rainbow on the 6th, 10:30 P.M.
SEPTEMBER.—Fair weather.
OCTOBER.—Very fine. Mostly Indian Summer.
NOVEMBER.—Clear dry weather, with heavy fogs.
DECEMBER.—Low temperature, dry weather, and heavy snow storms. Cumberland River frozen over on 31st.

A. C. FORD, *Observer.*

DEATH RATES IN CITIES IN THE UNITED STATES DURING THE YEAR 1876.

(TAKEN FROM THE RICHMOND, VA., REPORT FOR 1876.)

CITIES.	STATES.	Estimated present Population.	Deaths in 1876.	Death Rate per 1000 Inhabitants.
New York	New York	1,070,276	29,152	27.23
Philadelphia	Pennsylvania	825,594	18,892	22.88
Brooklyn	New York	506,223	12,304	24.30
St. Louis	Missouri	501,489	7,890	15.73
Chicago	Illsnois	420,000	8,680	20.66
Baltimore	Maryland	350,000	7,382	21.09
Boston	Massachusetts	341,919	8,199	23.97
San Francisco	California	300,000	5,669	18.31
Cincinnati	Ohio	265,000	5,710	21.54
Cleveland	Ohio	161,000	3,089	19.18
Hudson County	New Jersey	166,887	4,318	25.87
Washington	District of Columbia	160,000	4,234	26.46
Louisville	Kentucky	160,000	2,775	17.34
Pittsburgh	Pennsylvania	142,000	2,896	20.39
Providence	Rhode Island	101,500	1,864	18.36
Milwaukee	Wisconsin	100,781	2,084	20.67
Richmond	Virginia	75,000	1,649	21.98
Charleston	South Carolina	56,540	1,865	32.98
New Haven	Connecticut	60,000	1,232	20.53
Toledo	Ohio	50,000	740	14.80
Memphis	Tennessee	50,000	1,253	25.06
Cambridge	Massachusetts	50,000	966	19.31
Lowell	"	50,000	1,147	22.94
Worcester	"	50,000	1,127	22.54
Fall River	"	46,000	1,110	24.13
Reading	Pennsylvania	40,109	990	24.40
Mobile	Alabama	40,000	1,120	28.00
Evansville	Indiana	40,000	708	17.70
Patterson	New Jersey	38,875	1,066	27.42
Dayton	Ohio	36,000	521	14.47
Lawrence	Massachusetts	36,000	845	23.47
Quincy	Illinois	35,181	585	16.62
Minneapolis	Minnesota	35,000	457	13.05
Lynn	Massachusetts	32,600	718	22.02
Utica	New York	32,070	559	17.43
Grand Rapids	Michigan	32,000	388	12.12
Springfield	Massachusetts	30,000	631	21.03
Peoria	Illinois	30,000	434	14.46
Harrisburg	Pennsylvania	30,000	488	16.25
Nashville	Tennessee	27,000	904	33.48
Erie	Pennsylvania	26,037	350	13.44
Salem	Massachusetts	26,000	608	23.38
Salt Lake	Utah	25,000	386	15.44
Wheeling	West Virginia	28,000	611	21 35
New Bedford	Massachusetts	25,876	596	23.03
Sacramento	California	24,000	349	14.54
Norfolk	Virginia	23,500	502	21.36
Elmira	New York	20,538	305	14.85
Denver	Colorado	20,000	197	9.85
Wilmington	North Carolina	20,000	270	13.50
Petersburg	Virginia	20,000	569	28.45
Poughkeepsie	New York	19,900	335	16.83
Allentown	Pennsylvania	18,000	358	19.88
Yonkers	New York	17,500	383	21.77
Newburgh	New York	17,500	349	19.94
Norwich	Connecticut	17,500	445	25.42

Death Rates in Cities in the United States—Continued.

CITIES.	STATES.	Estimated present Population.	Deaths in 1876.	Death Rate per 1000 Inhabitants.
Gloucester	Massachusetts	16,754	432	25.76
Waterbury	Connecticut	16,049	290	18.06
Burlington	Vermont	16,000	148	9.25
Austin	Texas	15,000	207	13.80
Lynchburg	Virginia	15,000	389	25.93
Galveston	Texas	.....	555	13.87
Haverhill	Massachusetts	14,628	257	17.56
Keokuk	Iowa	14,000	221	15.78
Newburyport	Massachusetts	13,323	295	22.14
Knoxville	Tennessee	13,000	168	12.92
Hannibal	Missouri	11,000	310	28.18
Lansing	Michigan	8,624	92	10.66
Natchez	Mississippi	8,000	139	17.00
Selma	Alabama	7,500	136	18.13
Manchester	Virginia	6,600	131	19.84

DEATH RATE IN FOREIGN CITIES.

TAKEN FROM THE RICHMOND, VA., REPORT FOR 1876.

CITIES.	COUNTRIES.	Estimated Population 1876.	Number of Deaths.	Death rate per 1000 Inhabit'ts.
London	England	3,489,428	77,411	22.18
Brighton	England	100,632	1,968	19.55
Portsmouth	England	124,867	2,748	22.00
Norwich	England	83,430	1,823	21.85
Plymouth	England	72,230	1,593	22.05
Bristol	England	199,539	4,491	22.50
Wolverhampton	England	72,549	1,723	23.74
Birmingham	England	371,839	8,425	22.65
Leicester	England	113,581	2,614	23.01
Nottingham	England	93,627	2,196	23.34
Liverpool	England	521,544	14,347	27.50
Manchester	Englund	357,917	10,413	28.09
Salford	England	138,425	4,467	31.83
Oldham	England	88,609	2,593	29.26
Bradford	England	173,723	4,138	23.81
Leeds	England	291,580	7,307	25.06
Sheffield	England	274,914	6,666	24.24
Hull	England	136,933	3,131	22.86
Sunderland	England	108,343	2,265	20.90
New Castle-on-Tyne	England	139,929	3,183	22.74
Dublin	Ireland	314,666	8,097	25.73
Glasgow	Scotland	545,144	13,759	25.23
Edinburgh	Scotland	215,146	4,391	20.40
Dundee	Scotland	139,125	3,075	22.10
Aberdeen	Scotland	96,499	2,033	21.08
Greenoch	Scotland	70,192	1,614	22.99
Paisley	Scotland	48,679	1,287	20.45
Leith	Scotland	52,919	1,174	22.18
Perth	Scotland	26,535	640	24,11
Calcutta	India	429,535	12,732	29.64
Bombay	India	644,405	20,594	31.92
Madras	India	397,552	15,097	37.97
Paris	France	1,851,792	49,288	26.61
Brussels	Belgium	188,609	4,700	24.91
Amsterdam	Holland	289,981	7,430	24 62
Rotterdam	Holland	136,232	3.710	28.23
The Hague	Holland	100,254	2,704	26.97
Copenhagen	Denmark	211,000	5,291	25.07
Christiana	Sweden	77,000	1,797	23.33
Berlin	Germany	980,000	28,963	29.55
Hamburg	Germany	388,618	9,660	24.85
Breslau	Germany	240,471	7,828	32,55
Munich	Bavaria	193,450	6,777	35.54
Vienna	Austria	690,205	18,837	27.29
Buda Pesth	Hungary	300,000	12,292	20.97
Rome	Italy	264,280	9,563	36.18
Turin	Italy	219,173	5,345	24.38
Alexandria	Egypt	212,034	9,108	42.95
Helsingfen	Finland	34,100	959	28.12
Zurich	Switzerland	64,469	1,769	27.43
Basel	Switzerland	48,497	1,254	25.89
Berne	Switzerland	39,782	1,247	31.34
Lausanne	Switzerland	29,801	714	23.88
Messina	Italy	1117,164	3,134	27.60

CAUSE OF DEATH.	JAN. W. Male.	JAN. W. Female.	JAN. C. Male.	JAN. C. Female.	FEB. W. Male.	FEB. W. Female.	FEB. C. Male.	FEB. C. Female.	MARCH. W. Male.	MARCH. W. Female.	MARCH. C. Male.	MARCH. C. Female.	APRIL. W. Male.	APRIL. W. Female.	APRIL. C. Male.	APRIL. C. Female.	MAY. W. Male.	MAY. W. Female.	MAY. C. Male.	MAY. C. Female.	JUNE. W. Male.	JUNE. W. Female.	JUNE. C. Male.	JUNE. C. Female.	JULY. W. Male.	JULY. W. Female.	JULY. C. Male.	JULY. C. Female.	AUG. W. Male.	AUG. W. Female.	AUG. C. Male.	AUG. C. Female.	SEPT. W. Male.	SEPT. W. Female.	SEPT. C. Male.	SEPT. C. Female.	OCT. W. Male.	OCT. W. Female.	OCT. C. Male.	OCT. C. Female.	NOV. W. Male.	NOV. W. Female.	NOV. C. Male.	NOV. C. Female.	DEC. W. Male.	DEC. W. Female.	DEC. C. Male.	DEC. C. Female.	Total for Year.
Pneumonia		2	2	1	2	2		2		1	4	1	4	2	6	4	1	2	2	4		1						2											1		2		2	3		5	62
" Pleuro																																												1		1
" Typhoid																																	1					1					1	1		4
Poison																																														
Psosiasis																																														
Purpura																																														
Placentia previa				1																																										1
Pyemia																																							1							1
Rheumatism																			1																							1				2
Scrofula	1			2			1						1		2				1	1		1	1					2													1				14
Septicemia																									1												1								2
Small-pox																																														
Spine, Disease of												1													1		1			1													1		5
Spina Bifida																																														
Strangulation																																														
Suicide	1																				1																1								3
Suffocation	2																																													2
Syphilis								1						1																																2
Sun Stroke																									1	1																			2
Trismus Nasc'tium						1															1			2				1										2				1		1		9
Tabes Mesenterica							1				1								1																				1							4
Teething				2			1	1							1						2	1	2	4	1	1	4	6	1	2	1	1	1									1	1		33
Tetanus																									1						1														2
Tumor Uterus						1																																							1
Ulcer of Leg																																														1
Unknown		2	1		1	1		1		1	3	1	1		1	2			1	1	1			1					1						1			1				1			23
Whooping Cough										1	1		1			1																			1										9
Wounds	1			1									1							1														1			2			1					5
" Railroad	1								1																															1						3
Worms																																										1				1
Womb, Disease of												1																																		1
Totals	14	21	15	22	9	13	8	16	16	13	19	21	19	28	21	20	13	13	21	22	19	27	14	23	27	13	29	34	17	12	19	21	15	15	9	18	24	26	16	20	25	24	9	15	16	31	18	19	899
Premature Births																							1					1		1			1		2			1		1			1					9
Still Born			1			1	1														2	1	2	1			1	1			3	2	1	2	2		1		2	1	1		1	1		1	2	28

MORTUARY STATISTICS OF NASHVILLE FOR 1876.

Sex and Social Relations.

SEX AND SOCIAL RELATIONS.	JAN.		FEB.		MAR.		APRIL.		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Male	14	15	9	8	16	19	19	21	13	21	19	14	27	29	17	19	15	9	24	16	25	9	16	18	214	198	412
Female	21	22	13	16	13	21	28	22	13	22	27	23	13	34	12	21	15	18	26	20	24	15	20	19	236	251	487
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	36	39	450	449	899
Married	9	8	5	1	10	6	9	41	26	8	6	6	8	8	5	7	9	2	11	16	10	4	10	4	100	74	174
Single	22	21	12	17	15	29	32	4	8	28	35	27	28	52	20	27	16	20	37	14	34	16	33	29	297	313	610
Widow	3	8	3	6	4	3	4	33	12	5	4	3	3	2	2	4	4	4	1	5	2	3	2	3	37	50	87
Widower	1		2			2	2	4	5	2	1	1		1	2	2	1	1	1	1	3	1	2	1	16	12	28
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876—BY AGES.

AGES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Under 1	7	9	5	7	5	19	7	10	7	10	20	10	9	21	5	6	3	6	6	8	7	3	3	10	84	119	203
From 1 to 2	3	3	.....	4	3	.....	3	4	2	2	4	4	3	8	6	8	2	2	4	2	2	2	6	2	38	41	79
From 2 to 3	.....	1	1	2	2	2	3	3	.....	4	5	4	3	10	3	5	2	.....	5	2	2	.....	6	.....	36	35	71
From 3 to 4	.....	2	.....	.....	1	1	3	2	.....	1	1	3	1	3	1	2	1	1	5	.....	4	2	2	.....	19	17	36
From 4 to 5	.....	.....	1	.....	1	1	1	1	.....	1	.....	3	2	.....	.....	2	2	2	9	.....	.....	2	2	5	18	17	35
From 5 to 10	1	3	.....	.....	.....	.....	2	1	2	1	1	1	1	7	.....	1	2	2	5	3	8	4	8	1	30	24	54
From 10 to 15	1	.....	.....	.....	.....	1	.....	2	.....	2	1	2	1	1	.....	.....	2	1	.....	.....	1	1	1	2	7	12	19
From 15 to 20	2	3	1	3	2	2	2	4	1	4	1	.....	2	2	1	2	.....	1	.....	2	1	.....	.....	.....	13	23	36
From 20 to 30	9	3	2	2	3	5	6	2	2	3	3	2	2	4	3	2	1	7	3	4	4	3	3	4	41	41	82
From 30 to 40	4	3	3	1	2	3	2	2	4	3	3	.....	6	4	2	2	2	1	2	5	4	4	5	2	40	30	70
From 40 to 50	2	4	.....	1	4	2	6	3	2	5	2	3	5	.....	4	2	6	.....	3	5	4	2	2	1	40	28	68
From 50 to 60	3	3	4	2	1	3	3	4	4	4	1	.....	1	1	1	1	4	1	2	3	3	.....	3	3	30	25	55
From 60 to 70	3	2	3	1	3	1	4	1	1	.....	.....	2	4	1	3	5	2	1	4	.....	2	.....	3	3	32	17	49
From 70 to 80	.....	.....	2	1	1	.....	.....	.....	.....	2	2	3	.....	.....	.....	2	1	1	2	1	2	1	2	2	12	13	25
From 80 to 90	.....	1	.....	.....	.....	.....	4	.....	1	1	1	.....	.....	1	.....	.....	.....	.....	.....	1	1	.....	1	.....	7	4	11
From 90 to 100	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	2	4
100 and upward	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	40	30	27	50	36	49	24	47	37	450	449	899

MORTUARY STATISTICS OF NASHVILLE FOR 1876.—NATIVITY.

NATIVITIES.	JAN.		FEB.		MAR.		APRIL		MAY.		JUNE.		JULY.		AUG.		SEPT.		OCT.		NOV.		DEC.		Total White.	Total Colored.	Sum Total.
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.			
Nashville, Tennessee	28	32	17	22	22	38	30	40	18	40	35	33	28	61	22	35	14	22	33	35	35	24	38	33	320	415	735
Other States	3	5	5	2	6	2	7	1	2	3	10	4	7	2	6	5	8	5	10	1	9	.....	7	4	80	34	114
Ireland	3	.....	.....	.....	.....	.....	3	.....	4	.....	1	.....	3	.....	.....	.....	7	.....	3	.....	4	.....	.....	.....	28	.....	28
Great Britain	.....	.....	.....	.....	.....	.....	3	.....	1	.....	.....	.....	1	.....	1	.....	1	.....	2	.....	1	.....	1	.....	11	.....	11
Dominion	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Germany	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	5	.....	5
Italy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	3
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Scandinavian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
Total	35	37	22	24	29	40	47	41	26	43	46	37	40	63	29	49	30	27	50	36	49	24	47	37	450	449	899

Topography of Nashville.

The City of Nashville, Tennessee, is situated on the left bank of Cumberland River, two hundred miles above its mouth, about thirty-three miles south of the Kentucky State line, and eighty-two miles north of the State line of Alabama, in latitude 36° 10′ north, and longitude 86° 49′ west of Greenwich; and is almost at the exact geographical centre of Davidson County, of which it is the county seat. Cumberland River enters the city limits at their eastern boundary, flows westwardly and curving to the right passes out of the city in a current flowing nearly due north; thence sweeping to the left in a curve having a radius of about one $8\frac{1}{2}$ miles, reaches a point west of the city about $4\frac{3}{4}$ miles distant from the point at which it first enters the city from the east. A chain or circlet of beautiful conical shaped hills stretches in a curve from the river above to the river below the city, which thus lies bounded upon the north and northwest by the beautiful winding Cumberland, and upon its southern and south-western front by a rampart of hills, now famous in history and still bearing the stamp and sign manual of war in its many crumbling breastworks. Such is briefly a general description of this locality, which embraces much more than the area within the city limits.

To make the description more minute, the territory described is divided naturally into four sections, which may be designated as the Eastern, the Middle, the Northwestern and the South-western. These are separated by the valleys traversed by small streams, known by the local names of Lick Branch and Wilson's Spring Branch. These streams take their rise in the chain of hills southwestwardly from the city, and flowing northeastwardly through the city empty into the Cumberland a little more than a mile apart. The city is thus topographically divided into three

METEOROLOGICAL RECORD *for the Year* 1876, *kept at Nashville, Tenn. Latitude* 36° 11′, *Longitude* 86° 53′, *W. from Greenwich. Elevation of Barometer above sea level,* 504.2 *feet.*

DATE.	BAROMETER.							THERMOMETER.							WIND.							Am't Rain and Melted Snow.		Relative Humidity.
	Mean.	Mean of—			Range.			Mean.	Mean of—			Range.			Prevailing Direction.	Number of Miles.					Total.	Am't in inches.	No. days which rain or snow fell.	
		A. M. observation.	P. M. observation.	Night observation.	Highest.	Lowest.	Difference.		A. M. observation.	P. M. observation.	Night observation.	Maximum.	Minimum.	Difference.		Noon to 6 P. M.	6 P. M. to midnight.	Midnight to 6 A. M.	6 A. M. to noon.	Maximum velocity during month.				
January	30.197	30.234	30 163	30.201	30.609	39.628	0 981	47.3	42.2	52.9	46.6	73.0	17.0	56.0	S.	1,268	895	895	1,152	22	4,210	6 41	10	66.8
February	30.137	30.181	30.095	30.147	30.640	29.552	1.087	46.2	40.2	52 9	45.0	73.0	9.0	64.0	S.	1,225	822	639	901	28	3,588	2.22	5	63.7
March	30.018	30.041	29 983	30 016	30 501	29.385	1.119	46.6	40.7	52.0	46 0	76 0	14.0	62.0	W.	1,574	1,020	896	1,220	24	4,710	5.28	11	59.9
April	30 011	30.048	29.972	30.001	30 332	29.636	0.696	60.5	54 6	67 1	58 8	80.0	37.0	43.0	S.	1,223	653	475	956	14	3,307	3.62	9	54 3
May	29.994	30.030	29.955	29.991	30.205	29.733	0.472	70 3	65.6	76.3	68.3	90.0	42.0	48.0	S	1,173	558	456	983	16	3,170	3.40	11	61.3
June	29.942	29.967	29.903	29 945	30.122	29 659	0.463	76.5	73.5	82.8	73 6	94.0	58.0	36 0	S.	1,174	497	364	900	14	2,935	5.65	14	65.7
July	29.996	30.023	29.957	30 002	30.139	29.809	0.330	80.9	78.8	85.9	77 6	97.0	58.0	39.0	W.	1,078	444	269	778	16	2,569	7.15	11	68.1
August	30 008	30.033	29.969	30 008	30.183	29.807	0 376	78.7	75.5	84.1	76 2	95.0	60.0	35.0	E.	1,005	352	244	678	20	2,279	5.77	14	73.5
September	29.976	30 007	29.934	29 985	30.201	29.699	0.502	69 2	63.7	76.7	66 4	91 0	42.0	49.0	N.W.	901	341	260	714	12	3,216	2.52	5	68.4
October	30.029	30.076	29.980	30.033	30.385	29.589	0.796	56.7	49 3	65.7	54.1	80.0	29 0	51.0	N.W.	1,120	547	460	896	18	3,023	2.68	7	63.4
November	30.039	30 068	30 001	30 047	30.328	29.611	0.717	46.4	41.7	51.7	44.8	77.0	23.0	54 0	N.W.	967	632	674	835	16	3,108	1.26	9	67.7
December	30.154	30.196	30.123	30.154	30.528	29.627	0.901	30.8	24.0	36.1	30.5	64.0	—.2	66.0	W.	907	525	519	699	14	2,648	0.95	9	66.6
Totals																13,615	7,286	6,145	10,713		37,763	46.91	115	
Annual Means	30.041	30.975	30.002	30 644	30.347	29.644	0.703	59.1	54.1	65.3	57 3	82.5	32.2	50.2	W.	1,134	607	512	892	17	3,146	3.90	9.5	64.9

JANUARY.—Very warm weather. Peach-trees bloom on the 29th.
FEBRUARY.—Warm pleasant weather. Fruit-trees continue to bloom and bud.
MARCH.—Changeable and disagreeable. Heavy snow storm on the 20th.
APRIL.—Warmest month of the name since 1872.
MAY.—Noticeable absence of thunder and lightning during rain. Fine weather for vegetation.
JUNE.—Frequent thunder showers. Very seasonable weather.
JULY.—Rainfall in excess. Dangerous floods in small streams.
AUGUST.—Frequent thunder storms and heavy rains. Lunar Rainbow on the 6th, 10:30 P. M.
SEPTEMBER.—Fair weather.
OCTOBER.—Very fine. Mostly Indian Summer.
NOVEMBER.—Clear dry weather, with heavy fogs.
DECEMBER.—Low temperature, dry weather, and heavy snow storms. Cumberland River frozen over on 31st.

A. C. FORD, *Observer.*

respectively above low water. From this hill the ground descends rapidly to the valley of Lick Branch on the north and west, but the crest of the spur follows a southerly direction along the line of Spruce Street at a average elevation of 120 feet above low water for nearly a mile, then gradually ascends and unites with the main ridge at Curry's Hill, at the same point as the eastern division.

The third or northwestern division embraces all the territory northwestwardly from the valley of Lick branch, and lying altogether in the encircling bend of Cumberland River. A rock bluff 75 feet high fronts the river on the east, but bends away from the river shortly below the city limits, and retaining to a great extent its precipitous character leaves a stretch of bottom land between its base and the river bank, averaging nearly a mile in width entirely around the bend from the city limits to the point where the circlet of hills reaches the river near Clifton. Between this wide bottom land and the valley of Lick Branch the surface of the country is elevated, rolling and beautiful in its undulating variety, elevated generally from 80 to 100 feet above low water, and rising occasionally into high points as at St. Cecilia Academy 165 feet, and Fisk University 154 feet above low water. This division is finally bounded on the Southwest by the chain of hills extending from Clifton to the Charlotte Turnpike. Fort Gillem was formerly built upon the site now occupied by Jubilee Hall of the Fisk University.

The fourth or southwestern section comprises all that area which lies between the two prongs of Lick Branch, one of which taking its rise near the State Fair Grounds is known as Cockrills Spring branch, and the other rising near the eminence known as Curry's Hill runs nearly parallel with the river, and unites with Cockrills Spring branch at a point nearly due west of the Capitol. The territory thus bounded is undulating, intersected by numerous tributaries of one or the other of the two streams mentioned, and rises at first gradually and then more rapidly to the chain of hills extending from Curry's Hill to the Charlotte Turnpike. The summits of these hills have an elevation ranging from 220 to 380 feet above low water, and they are separated by numerous lower points or gaps through which the different turnpikes and the Nashville, Chattanooga & St. Louis

Railroad are built. Many prominent points are comprised within this area: one just outside the city limits, where Fort Houston was built, 178 feet above low water; another occupied by Vanderbilt University, the highest point in those grounds being 205 feet above low water.

Thus are briefly described the salient togopraphical characteristics of Nashville and its immediate vicinity. By describing more particularly the valleys herein mentioned and their condition during time of high water, a clear understanding can be had of their relation to the city. The valley of Lick Branch is a nearly level area, about one half mile wide at its broadest point, and narrowing to 300 yards wide at the junction with Cockrill's Spring branch, nearly one mile from the river. Its average elevation is thirty-two feet above low water, back as far as the crossing of Spruce Street, from which point it rises to forty-seven feet at the junction of Cockrill's Spring branch, and still more rapidly thence to the head of both branches. As the difference between low water herein referred to and extreme high water is 57 feet, it will be seen that at time of the highest water, the valley of Lick Branch is covered to a depth, at the junction of Cockrills Spring branch, of ten feet, and thence ranging to twenty-five feet deep at the lower points. This extreme height has been reached but once since Nashville was known as a locality, to-wit in 1847. A height only five feet less, however, has been reached frequently.

The valley of Wilson's Spring branch, which is about one quarter mile wide shortly above its mouth and 100 yards wide half a mile from the river, rises gradually from an elevation 39 feet above low water at its widest point to 57 feet above low water half mile from the river. This valley, therefore, has been flooded to a depth ranging from 18 feet deep to nothing half mile back. It is, therefore, evident that at a time of extreme high water there are two wide inlets or bays from the river, one of which is half mile long, the other over one mile, which separate the first, second and third divisions of the city from each other. A reference to the accompanying map will show the locations more clearly.

That portion of the vicinity of Nashville which lies on the

north and east side of Cumberland River is occupied by the beautiful and thriving city of Edgefield. Its southern portion is delightfully situated upon ground which rises gradually eastwardly from the river, and culminates in an eminence about one and a quarter miles from the river, 200 feet above low water.

The northern portion is situated upon less elevated and rolling ground which extends back far beyond the city limits, and finally rises into a series of hills running northeastwardly from the river.

These two sections are separated by the valley of a stream which rises about three and a half miles from the river, flows southwestwardly and empties into the river above the railroad bridge. The valley of this stream is about 200 yards wide, and is covered by high water to a depth of 12 to 15 feet within the limits of the town.

The above description is probably sufficiently minute to convey a correct idea of the topographical features of the city and its natural facilities for drainage, and this leads naturally to the consideration of the artificial drainage or sewers of the city. At present this feature is imperfect, and in no one case fully developed. Detached portions of what may once become main sewers have been constructed, and many subsidiary lines emptying into these fragmentary mains have already been built. This being the case it follows that no systematic or complete disposition of the sewer drainage has in any one case been fully accomplished. That which approaches nearest to a proper discharge of its contents is the Church street or Maxwell House sewer, which, however, empties upon the bluff of the river about 30 feet above low water mark, at which point the odors of its contents are distributed in the open air not more than 100 yards from a densely built business portion of the city. In all other cases the discharge of the main sewers is at convenient points in the low grounds, where the sewerage is either absorbed by the soil or flows slowly by sluggish and winding channel, exhaling its odors as it goes, until it reaches the river.

For the most part the construction of the larger sizes of our sewers consists simply of two roughly built stone walls, covered by stone flagging, thus forming a rectangular shaped sewer and

usually having a solid rock bottom. The excavation for this structure is generally in solid rock, and fortunately the declivity or grade is in most cases so steep that it is not difficult to keep even these cheaply constructed sub-drains reasonably clean by the free use of water from the City Water Works, together with the scouring they receive in time of heavy rains. If this were not the case this rough construction would be very objectionable, but under the circumstances which exist they can be made, *by the free use of water*, to answer every purpose. The smaller sewers or subsidiary drains are mostly of vitrified clay pipe, and when laid under direction and supervision of the city authorities are of suitable dimentions and properly laid.

Approximately the total amount of sewers at present constructed are as follows:

Stone or brick sewers, ...Six miles.
Clay pipe sewers, ...Half mile.

A perfected system of sewerage for Nashville would probably embrace the following items:

First. Two primary main lines, following respectively the valleys of Lick Branch and Wilson's Spring branch.

Second. Secondary main line as follows:

1st. On Broad street from Spruce street to the river, receiving and disposing of the contents of all the sewers now built or hereafter required in a large portion of the first, third and fifth wards.

2d. A completion of the tenth ward sewer, from Lick Branch to near the corporation line on Division street.

3d. An extension of the Mallory street sewer to Brown's Creek.

4th. Along the valley of McGavock Spring branch, from near the Cotton Factory to the river.

Third. Tributary lines emptying into one or other of these primary or secondary mains, following the lines of alleys where practicable, but located in all cases to be most easily accessible, and to best accomplish the drainage of the largest area.

Fourth. Minor tributary lines and service pipes to be constructed as necessity may demand.

Fifth. Stench traps should be constructed at every inlet from open gutters, and ample provision should be made for ventilation and for disposing of accumulated gases. This can probably be best accomplished by the construction of ventilating shafts at elevated points, and by properly utilizing the down pipes of buildings.

It is believed that every one of the sewers at present constructed, can be embodied into and form part of the above described general plan, with the exception perhaps of those which lead southwardly from Broad street east of Summer street. It is probable that these should be abolished after the construction of the Broad street main line.

WATER SUPPLY.

The condition of the works for supplying the city of Nashville with water at present is as follows: the engine house is located at a point on the bank of Cumberland River, only a short distance above the central portion of the city. The water is taken into suction pipes directly from the river and is pumped into a reservoir, having a capacity of 2,200,000 gallons, situated upon the top of the bluff adjacent to the engine house, from which it is carried to consumers through the street mains, entirely without filtration or purification of any kind whatsoever. The daily consumption of water is but little less than 2,000,000 gallons, which being nearly the full capacity of the reservoir, makes it impossible to allow even settling before the water is taken to consumers. It is also necessary that the engine work every day, and any accident which would stop the machinery more than twenty-four hours, would exhaust the reservoir and leave the city entirely without water. The pumping machinery is old and requires constant attention and repairs to keep it in running order.

When the reservoir is full, the surface of the water is 177 feet above low water in the river, but this elevation does not furnish sufficient head to supply even the lower stories of many buildings; the upper stories of quite a large number being never supplied.

The character of the water itsetf is far from satisfactory, its

contamination from city drainage and other causes being such, as in the opinion of the Board of Health and the medical profession generally, makes it one of the chief causes of many of the diseases which afflict our citizens.

A consideration of these facts has created a public sentiment which urgently demands improvement in these matters. The proposed changes comprise three distinct features, to-wit:

1st. New pumping machinery.

2d. An arrangement for filtering the water.

3d. An enlarged reservoir upon a more elevated site.

A contract has already been made for new pumping machinery, which will be of sufficient capacity to lift ten million gallons of water into a reservoir 275 feet above low water in twenty-four hours. This machinery will be in position and ready for use within eight months from this date.

The construction of the new reservoir has not yet been fully determined upon. The proposed site is the summit of Curry's hill, which should be cut down so that sufficient area will be obtained to construct a reservoir capable of holding fourteen million gallons of water, the top of its walls to be 275 feet above low water. This will afford a head sufficient to throw the water easily into the Representatives Hall of the Captitol building. The grounds surrounding the reservoir should be handsomely graded and improved, and the present barren and unsightly hill converted into a beautiful and attractive feature in the landscape.

The third feature in the general plan, to-wit the scheme for filtration, has been thoroughly considered and discussed, meets with general favor, and will probably be carried into execution without much delay. As this project is of the greatest importance in a sanitary point of view, and embraces features not so fully developed in any other locality, a full description may not be out of place.

At a point 10,500 feet up the river from our engine house where the pumping machinery is located, and entirely above any contamination from city drainage, is the foot of an island, which at low water is 2,600 feet long, and has an average width of 580 feet, making an area of about 34½ acres. At ordinary boating stages of the river, the area is about 30 acres. This island is a

mass of remarkably clean gravel and sand, almost entirely free from loam or soil, and rests upon the bed rock of the river at a depth of six feet below low water mark. The summit of the island, which for an area of about 12 acres is nearly level, is 29 feet above low water, thus making the entire depth of this gravel bed 35 feet to the bed rock. A long bar of the same formation as the island extends both up and down the river, so that the total area of this mass of gravel would not be overstated at 100 acres. It is proposed to utilize this natural filter bed by the construction of what may be called a "filter box," shaped in a T form thus and strongly built of wrought iron. The outside perimeter will measure 236 feet. The open space enclosed will be 10 feet in the clear. The depth from top to bottom of the box will be 12 feet. The bottom of the box will be open. The lower portion from the bottom upward, a distance of 5 feet, will be grate work, having openings ¼ inch square to admit the water. The remainder of the sides and the top of the box will be solid, and will not admit water. A well or man-hole will extend from the top of the box to the surface of the island, and will be securely closed at the top. The "filter box" thus constructed will be sunk to and rest upon the bed rock of the river, at or about the center of the island. It will be seen that all the water which enters this box must pass through the gravel of the island—from the sides about 300 feet, or from the top when the island is covered by high water (which is the case about two months in each year), a distance of not less than 30 feet. This latter may be increased if necessary to 40 or 50 feet, by forming an embankment of gravel over the filter box.

Careful surveys and soundings have developed the fact, that the bed rock of the river extends with great uniformity from the island to the present pump house. Numerous gravel bars intervene, varying in depth from two to five feet. In comparatively little of the distance is the bed rock uncovered. In order to utilize the filter box above described, it is proposed to lay a 36-inch iron main pipe from the filter box to the pump-house, where it will connect with the suction pipe of the pumping machinery, which will be fed directly from its lower extremity.

Experiments made with a small well have demonstrated con-

clusively both the amount of water which will pass into the filter box thus placed, and the very greatly superior character thereof in comparison with that which we now use. It is confidently believed that after the completion of this work, Nashville will be abundantly supplied with water as pure as any city in the United States possesses.

With a location admirably adapted to drainage and cleanliness; its beautiful surroundings; its ample facilites by railroad, river and turnpike for transportation and communication with other sections; situated in the heart of a country famous for its unequaled fertility; within easy reach of inexhaustible stores of iron, coal and other mineral wealth; provided, as it may reasonably expect to be, with an abundant supply of the purest water, and an ample sewerage system; blessed with a climate such as few localities possess, and furnished already with educational institutions of the highest grade, it is only reasonable to expect for the future of Nashville a career of rapid growth, solid and enduring prosperity.

SUB-DIVISION OF THE TERRITORY OUTSIDE OF THE CORPORATE LIMITS OF THE CITY EMBRACED WITHIN THE JURISDICTION OF THE BOARD OF HEALTH OF THE CITY OF NASHVILLE.

Division No. 1.	Extending from the Cumberland River north of the city to center of Jefferson street,	1068 acres.
Division No. 2.	Extending from center of Jefferson street to center of Church street,	902 "
Division No. 3.	Extending from center of Church street to center of Middle Franklin Turnpike,	716 "
Division No. 4.	Extending from center of Middle Franklin Turnpike to center of N., C. & St. L. R. R.	1290 "
Division No. 5.	Extending from center of N., C. & St. L. R. R. to Cumberland River, east of the city	1144 "
Total area outside of city limits within jurisdiction of Board of Health,		5120 acres.
Add area within corporate limits,		1824 "
Total area of jurisdiction of Nashville Board of Health,		6944 acres.

THE

TOPOGRAPHY AND GEOLOGY

OF NASHVILLE,

WITH

REMARKS ON THEIR SANITARY BEARINGS,

BY

J. M. SAFFORD, PH. D., M.D.,

Professor in Vanderbilt University and State Geologist.

TOPOGRAPHY AND GEOLOGY OF NASHVILLE.

Those who have been on the roof of the Capitol, or on the towers of Vanderbilt University, know how extensive and beautiful is the view presented. It is a grand panorama of the country extending for miles, and embracing the entire horizon. But the view on the west and north is different from that on the east and southwest. On the west and north are seen ranges of comparatively high ridges, from eight to ten miles away; while on the opposite side the country, spreading out indefinitely, lies at a lower level, with isolated hills here and there in view. This difference leads us to recognize two great natural divisions of Middle Tennessee. The ridges of the west and north, rising to the same general level and making the horizon, are the breaks and spurs of a great plateau that lies west of Davidson county, and extends for fifty miles towards the Tennessee river, while the lower country immediately around Nashville, and that lying to the east and southeast, is a portion of an area fifty miles wide and one hundred long, to which the name of *Central Basin* has been given. The plateau on the west is, indeed, but part of a great circle of flat highlands—a *Rim of Highlands*, nearly 1,000 feet above the sea, which sweeps completely around the Basin. Could our vision extend to the southeast far enough, say a score of miles beyond Murfreesboro, the breaks and slopes of the Highlands, limiting the Basin in that direction, would be discernible, opposing face to face those on sight in the west and northwest.

Nashville is in the western part of the Central Basin. Its location is comparatively low, for the Basin is slightly tilted to the West. Its elevation above the sea ranges from 422 to 560 feet, the former being the elevation of high water in the Cumberland.

The city is built upon low ridges, which are separated by small branches, there being two of the latter within the city proper. The water flows freely from these ridges, giving an easy and good natural drainage, the efficiency of which is seen in the thorough washing the streets of the city get in a heavy rain. The topography admits of an excellent system of underground sewerage, which we hope to see some day carried out.

The country around Nashville is, like the site of the city, rolling, with good natural drainage. The only exception to this are the bottoms of the river and the limited flats of the small streams. These, though not extensive, may be sources of malaria. Thorough draining and cultivation are the remedies. The low places along the branches within the city, those especially that are occasionally covered with high water, ought always to be looked after. Where practicable, they ought to be filled up; if this cannot be done, the ground should be ditched and kept clear of stagnant water. With the limited bottoms and low places drained, there is nothing in the topography of Nashville and of the country around, that we can discover, to induce disease. On the other hand the open country and rolling surface supply the city with the conditions of healthfulness.

The rock underlying the entire city is limestone, which is mostly of a bluish color, and generally very fossiliferous. The mass of rock is made up of several distinct, nearly horizontal, beds or strata, which differ in texture, in amount of impuritiy and in fossiliferous character. All belong to one of the oldest ages of Geology—the *Lower Silurian*—and to the upper division of this, called the *Cincinnati or Hudson River Epoch;* or as we have it in the "Geology of Tennessee," the *Nashville Epoch.* We shall give below a section of the beds outcropping about the city.

There is nothing, so far as we yet know, in the composition of these rocks to affect in any way the sanitary condition of the city unless it be that the water issuing from them in springs is made hard and calcareous. But limestone waters are found throughout Middle Tennessee, and are not considered unwholesome. If the springs within the city limits are contaminated by anything impure, it is by the polluted drainage waters which sink in from the surface, cesspools, and the like. That some are thus con-

taminated is probable, when we consider that the mass of limestone below us is more or less fissured, and even locally cavernous. The streams which supply the springs flow through passages or caverns in the rock. These communicate with the superficial soil, or even with the clay itself, by fissures and other openings. The result is evident. Where such infiltrations can occur, it would be wise to abandon the springs, even if it be necessary to replace them by free fountains to be fed by water (to be filtered soon, we hope) from the reservoir. Impure water —impure in the sense of containing material prejudicial to health—ought to be out of the question. Indeed the water we use, for the quiet and satisfaction of the public mind, ought to bear about it no suspicion of taint.

Nashville is sometimes said to be a "very hot" city for the reason that it is built upon rock, which at many points is scantily, or not at all, covered with soil. There can be very little or nothing in this. As a matter of fact the exposed limestone makes but a small proportion of the surface, either within the city or in its environs. It is the macadamized streets and the brick and stone pavements, together with the walls of buildings, that receive and give off heat. But these, adding paved streets, are common to all cities. All have or ought to have them, so that Nashville in this respect is placed at no comparative disadvantage. We think it would be hard to prove that Nashville has a higher mean temperature than that normally due to a city of its latitude and elevation. The remedy for hot streets is a free use of water, and where it can be done, the rearing of shade trees, taking care that the shade is not too dense, a mistake often made.

The following section shows the succession and character of the different limestone beds which outcrop within and about the city. For the benefit of our geological friends, the names of some of the characteristic fossils are also given. The first bed in the series is the uppermost, the others following in descending order:

(1.) *College Hill Limestone.* When freshly quarried, a dark blue, highly fossiliferous, coarsely crystaline and roughly stratified limestone, with more or ess of its laminæ shaly. The mass weathers, generally, into rough, flaggy limestones and shaly matter interstratified, often liberating multitudes of fossils —especially small corals.

Some of the layers of this limestone are wholly made up of corals and shells. *Chaetetes Constellaria antheloidea, Tetradium fibratum, Columnaria stellata, Stromatopora pustulosa, Strophomena alternata, Orthis lynx, O. occidentalis,* and many others are abundantly represented by individuals. *Bellerophon Troosti,* species of *Cyrtodonta* and *Ambonychia radiata* occur. This division is well seen on *College Hill,* and in the upper part of the bluff at the *Reservoir.* There is, also, a fine representation of it on *Capitol Hill,* around the Capitol. Its lowest layers are at the top of the bluff at the *Wire Bridge.*

These rocks pertain to the highest stratum in the vicinity of Nashville. The division at *Capitol Hill* measures 120 feet.

(2.) *Cyrtodonta Bed.* Immediately below the College Hill Limestone, is a remarkable bed of coarsely crystaline, ashen-gray, or light yellowish gray limestone, in great part made up of valves of species of *Cyrtodonta,* individuals of *Bellerophon Lindsleyi* and *B. Troosti.* Of the *Cyrtodontæ, C. Saffordi* is especially abundant.

This bed is best developed in the bluff at the Wire Bridge. It is here, ten or eleven feet thick, and forms one solid layer. The shells are silicified, and pretty generally have their edges rounded and worn, as if they had been rolled in currents of water, or by waves.

The bed is seen again at the Engine House of the Waterworks, where it is six feet thick. In tracing it beyond the Engine House, it very soon runs out, and is replaced by a compact, dove-colored limestone, like No. 3 below.

Descending the hill on the west side of the Capitol it is also seen, but it is, for the most part, replaced by the compact limestone spoken of. It is well exposed at other low points about the city, and has been traced, in some directions, a mile or two beyond the city limits. This rock has been used for building purposes to some extent, and for making corner posts. Maximum thickness, 11 feet.

(3.) *Bed of Limestone* of the common type; much like the College Hill Limestone, coarsely crystalline, fossiliferous, etc. It occurs below No. 5, on the west side of the Capitol. In the bluff at the Wire Bridge, it is 23 feet thick. In the bluff above the Engine House of the Water-works, it measures 28 feet.

(4.) *Dove Limestones.* This is, for the most part, a group of three layers. The upper layer is a light dove-colored compact limestone, 4 feet thick, breaking with conchoidal fracture, containing strings (mostly vertical) of crystaline matter, which show points on a horizontal surface. (Birdseye). The middle layer is, mainly, the common dark blue crystaline limestone, (2 feet). The lowest layer (4 feet), is mostly like the upper, but more or less mixed with blue layers. Such is the group as seen at the foot of Gay street, in a quarry on the river bank. This group presents itself at many points, in and around the city. It is conveniently studied at the quarry mentioned, at the foot of Gay street. At the end of the bluff beyond the Water-works, it may also be seen, and is here ten or eleven feet thick. The group may also be seen in the region of the Penitentiary, and of the old State quarry, overlying the rock of that quarry. It appears at many points in Davidson county, outside of Nashville. The layers are generally of desirable thickness, and are quarried at numerous points in and about the city for building and other purposes.

The group contains a number of species. Detached *siphuncles* of *Orthoceras*

Bigsbyi, and of an allied species, are numerous at some points, especially in the middle layer. *Tetradium*, *Bellecrophon*, *Murchisonia*, *Pleurotomaria*, and other genera are represented. It is in this group that *Leperditia Morgani* is found, Thickness 11 feet.

(5.) *Capitol Limestone.* This bed supplied the rock to build the Capitol, and was formerly well exposed in the old State quarry west, and in sight of the building. It is limestone, but has the appearace of a laminated sandstone. It is, in fact, a consolidated bed of calcareous sand, the sand being the comminuted fragments of shells and corals. Originally, the mass was drifted in running water, and arranged in laminæ. As we find the rock now, it is, when quarried, a massive, bluish gray, granular limestone, with a well marked lamellar structure. When cut and ground smooth, a block of it, presented edgewise, shows well the laminar character. Such a surface is bluish gray, plentifully banded with darker lines. The Capitol is a splendid presentation of this rock as a building material.

The rock often contains rolled fragments of the beaded siphuncles of species of *Orthoceras*. Some specimens of these are seen in the faces of the blocks in the walls of the Capitol. It exhibits, also, examples of cross stratification, another evidence of the current-action to which it was originally subjected. The mass contains some little silicious matter, mostly in grains, and in small fragments of silicified shells, so that they do not interfere, materially, with the working of the rock. It is easily quarried, and can be obtained in blocks of any disirable size. In its natural exposures it exfoliates in laminæ by long weathering.

The bed, pretty generally underlies the city; has been quarried at the foot of Gay street, on the river; is near the water under the Wire Bridge, and appears beyond the Water-works, where it has also been quarried, and is 20 feet thick. The lamellar structure of this bed runs into the one just below, and it is not always easy to draw a line of separation. Below the Wire Bridge, my measurements make the thickness of the bed 25 feet.

(6.) The *Orthis Bed* underlies the last, and is the lowest member of the Nashville formation. It is in the water below the Wire Bridge, but rises in going down the river, and may be studied in the bluff below the Railroad Bridge. It may be seen, too, and its *Orthis* gathered, at the first milestone on the Murfreesboro turnpike. It rises at the end of the bluff, beyond the Water-works; and still further east, as at Mount Olivet, it may be seen resting on the *Carter's Creek Limestone*—the upper member of the Trenton Formation.

The *Orthis Bed*, measured in other parts of Middle Tennessee, is from 50 to 60 feet thick.

The *Carters's Creek* Limestone, which at the Wire Bridge is below the bottom of the river, appears in full force in the valley of *Mill Creek*, a few miles from the city on the road to Murfreesboro. The strata rise in the direction of the latter place. The strata (lower *Trenton*) which come to the surface at Murfreesboro, lie 500 feet below the river-bed at the Wire Bridge.

REPORT TO THE BOARD OF HEALTH

ON THE

WATER SUPPLY OF NASHVILLE

By N. T. LUPTON,

Professor of Chemistry, Vanderbilt University.

WATER SUPPLY OF NASHVILLE.

In response to the request of the Board of Health, two short reports have been made of analyses of water taken from the Reservoir, from Judge's Spring, and from Wilson's Spring, the chief sources of supply for the city.

In this paper it is proposed to embody the substance of the reports referred to, together with additional matter obtained by further investigation.

IMPORTANCE OF THE SUBJECT.

The sanitary condition of potable waters supplied to the larger cities in Europe and in this country has been a subject of profound study on the part of chemists, and of deep interest to all who appreciate its important bearing on the health and happiness of communities. The rapid growth of cities, and the vast

ERRATA.

On page 159, 9th line from top, "hygiene" should read "hygienic."

On page 162, 8th line from bottom, "sorms" should read "forms."

On page 166, middle of page, "various qualities" should read "variable quantities." "Walkyn" should read "Wanlkyn."

On page 168, middle of page, for "Dr. Farlon" should read "Dr. Farlow."

On page 169, 17th line from bottom, "conferroid filements" should read "confervoid filaments.".

WATER SUPPLY OF NASHVILLE.

In response to the request of the Board of Health, two short reports have been made of analyses of water taken from the Reservoir, from Judge's Spring, and from Wilson's Spring, the chief sources of supply for the city.

In this paper it is proposed to embody the substance of the reports referred to, together with additional matter obtained by further investigation.

IMPORTANCE OF THE SUBJECT.

The sanitary condition of potable waters supplied to the larger cities in Europe and in this country has been a subject of profound study on the part of chemists, and of deep interest to all who appreciate its important bearing on the health and happiness of communities. The rapid growth of cities, and the vast increase of manufacturing establishments, have necessitated a careful study of the means best suited to prevent the pollution of the water we drink by sewerage and refuse, and thus remove one fruitful source of disease. The fact that drinking water is so easily contaminated with decaying organic matter, and often serves as the vehicle for the propagation of epidemic diseases, has given special importance to its chemical examination, and the means best adapted to its purification. In 1868 a Royal Commission was appointed by the English Government to investigate thoroughly the domestic water supply of Great Britain, and report upon the best means of preventing the pollution of rivers. This Commission, consisting of some of the ablest scientific men of England, collected a vast mass of most valuable material relating to the chemical examination, composition, classification, and wholesomeness of various kinds of drinking water, together with the condition of the water supplies of a large number of cities, towns, villages and rural districts of Great Britain. In other countries, as well as in our own, the ablest chemists have been employed to investigate this subject and devise remedies for the prevention or removal of such impurities

deleterious to health as naturally or by artificial means find their way into streams from which cities are supplied. While the literature of the subject has become abundant through the labors of scientific men, and much valuable information is embodied in their various reports, a special examination of the water supply of each locality is necessary to determine definitely the presence or absence, as well as the character and variety of substances injurious to health.

SOURCE OF NATURAL WATERS.

Whence comes the water of our rivers, wells and springs, and what is the nature of the impurities which it contains? This question is best answered by tracing some river to its source, as for instance the Cumberland, from which our supply is chiefly drawn. If we follow the banks of this river we shall find along its course various creeks and rivulets flowing into it, the main stream becoming smaller and smaller until we finally trace it to a spring bursting from some hillside or flowing from the crevice of some overhanging rock. Let us follow, in imagination at least, the narrow opening from which the stream issues, and we shall find it, like the river, gradually gathering strength from its tributaries, in this case, from underground rills and drops that trickle through the porous soil and earth; these rills and drops being supplied entirely by the rain that falls from the sky.

From the clouds, then, comes the water which supplies our springs and wells and rivers. These clouds are the condensed vapor which the sun has raised from the earth beneath. This vapor or water-gas exists at all times in our atmosphere and imparts to it that balmy softness so refreshing in the hot days of summer, while at night, as an invisible covering, it prevents the too rapid radiation of heat from the cooling earth, maintaining thereby an equality of temperature essential to the proper growth and development of vegetation. We see this partially condensed vapor rising often as fog from the surface of the river, and as it floats upward it is rendered invisible by the heat of the sun, or gathering in clouds is precipitated to the earth as rain. Thus it is, the sun is ever silently uplifting the vaporized water from river, lake and ocean, to be returned again as dew and rain and hail and snow.

Water, as condensed in the atmosphere, is *pure*, and with the exception of such floating particles as it may meet with in its downward course, so continues until it reaches the earth, where its solvent action finds ample material for exercise. Hence the impurities of spring and river water. The character of these impurities varies with the surface over which it has flowed, or the strata through which it has passed.

RAIN WATER.

While rain water, from the manner of its formation, can contain only a very small quantity of solid impurity, this is often of the most objectionable kind. Organic dirt and dust floating in the atmosphere with offensive gases, especially in and near large cities, constitute most objectionable impurities, rendering a suitable filtering apparatus not only desirable but essential to the thorough purification of cistern water.

RIVER WATER.

In addition to substances in solution, river water contains more or less matters in suspension which render it turbid or muddy. While this amounts ordinarily to only a few grains per gallon, in the aggregate the quantity transported by the rivers to the ocean is immense. It is estimated that the Mississippi carries annually to the Gulf of Mexico no less than 400,000,000 tons of sediment. At the mouths of rivers these deposits form bars or deltas. All alluvial bottom lands owe their existence and their fertility to this source. The nature of this suspended matter varies with the season, the character of the soil over which the water flows, and the nature of the substances emptied into the streams which furnish the supply. Water flowing from mountains and uncultivated uplands is usually clear, and may be regarded as wholesome, while that from cultivated fields is always to a greater or less degree polluted.

SPRING AND WELL WATER.

Deep well water and that from springs which have their source too deep to be affected by surface drainage can be regarded as free from organic impurity, but shallow spring and well water is suspicious, and always *dangerous*, when such springs or wells are

located in towns and cities. The British Commissioners in their report, copies of which are now before me, say: "Surface water draining from cultivated land is always more or less polluted with the organic matter of manure. Such water, of course, contributes very largely to rivers and streams which have already descended from their mountain or upland sources. Even when not contaminated by the accidental admission into it of the sewage of towns and villages, it is not of suitable quality for domestic purposes, but when it is further polluted by excremental drainage its use for drinking purposes becomes fraught with great risk to health. Still more dangerous to health is the water drawn from shallow wells, no matter upon what geological formation they may be sunk when they are situated, as is usually the case, near privies, drains, or cesspools. Many severe outbreaks of epidemic disease have been traced to the use of such water in villages and towns, and there is strong reason to believe that sporadic attacks of typhoid fever often occur in isolated country houses from the same cause."

THE NATURE OF IMPURITIES IN WATER.

Impurities found in water are of two kinds:

1. Organic.
2. Inorganic.

These may exist in two conditions, in solution and in suspension. While the quantity and quality of matters in solution vary, it will be found that all waters used for drinking and domestic purposes contain the metals Potassium, Sodium, Calcium, Magnesium, Iron, and Aluminium, in combination with Sulphuric, Nitric, Carbonic, Silicic, and Hydrochloric acids. They also contain a greater or less amount of organic matter. All *hard* waters contain Carbonate or Sulphate of Lime.

DELETERIOUS EFFECT OF IMPURITIES.

The mineral matters contained in drinking water when not in excess are generally harmless, but organic substances, in whatever form, are injurious to health. The washings of a city like ours are fearful to contemplate when we consider that they flow into the water we drink. It needs no argument to prove that the

contents of cesspools continually seeping or pouring their abominable filthiness into a river or into shallow wells and springs whose waters are used for domestic purposes, are injurious to health. The contemplation of such a condition of things is disgusting, apart from considerations of health, and yet communities are found where this condition exists. One portion of this organic matter remains in suspension, furnishing a *nidus* for the hatching of broods of fearful forms, while another portion passes into solution. In a hygiene point of view the effect of these suspended substances, whether mechanical, chemical or physiological, must vary with their quality and quantity. Mineral silt of clay and fine sand, no doubt, frequently causes irritation of the alimentary canal, and produces diarrhœa and other diseases of the intestines. The living organisms, both animal and vegetable, if not themselves injurious, show the presence of organic impurities which serve as their food, or indicate putrefaction. As already stated, it is no longer a question that drinking water often serves as a vehicle for carrying the germs of cholera, typhoid fever, and other zymotic diseases throughout a community. Ordinary vegetable substances may not contaminate water to any very objectionable degree, but animal substances are always deleterious. This kind of pollution is inevitable in a city like ours, where strata of underground rock lying near the surface cause shallow drainage and shallow springs, unless the supply be drawn from a point above the influence of such drainage. With reference to inorganic matters in solution, there is nothing in ordinary river and spring water to cause apprehension. Eminent authorities declare that a moderate quantity of salts, as commonly found in drinking water, is not objectionable on the score of health. London, one of the healthiest of cities in the world, is supplied with water which contains sixteen grains of solid matter per gallon. The British Commissioners, already referred to, say, in their valuable and elaborate Report: "While waters of excessive hardness may be productive of calculus and perhaps other diseases, soft and not excessively hard waters, if equally free from deleterious organic substances, are equally wholesome," and that in towns where the chief sanitary conditions prevail with tolerable uniformity, the rate of mortality is uninfluenced by the softness or hardness of the water supplied to the inhabitants. It is

the organic matter in solution and in suspension that is to be dreaded, and to the elimination of this, the attention of Sanitary Commissions has been specially directed. Speaking of the ravages of zymotic diseases propagated by the water we drink, the above-mentioned Report says: "The means of preventing much of this death and torture are well known and capable of practical application. Their neglect signifies the destruction of the people by parasitic organisms which we have the means but not the will to exterminate; and it will not much longer be regarded as involving less material disgrace than would attach to the annual loss and mutilation of vast numbers of our population by beasts of prey which we are too apathetic to destroy." To meet fully the requirements of health, the water supply of a city should be not only of *good quality*, but *abundant in quantity*. Nor should the supply be limited to the variety of purposes for which it is needed in domestic economy. Its cleansing efficacy cannot be too liberally applied to streets and sewers, if we would add to the comfort and well-being of the people, and escape the fearful ravages of epidemics.

METHODS OF PURIFICATION.

For the removal of suspended matter, whether organic or inorganic, two methods are practicable:

1. By settling.
2. By filtration.

The first requires large reservoirs, and is never so effectual as the latter. Both combined do not furnish a *perfect* safeguard against the propagation of zymotic diseases, if the water has once become polluted with the germs of disease. Natural filtration is preferable to artificial, only because the filtering beds of sand and gravel which nature supplies are larger, and as the water percolates through a large porous mass, a correspondingly increased oxidation and consequent destruction of organic matter is effected. Living or organized matter resists this procession of oxidation in water, just as seeds and living plants and animals resist the oxidizing action of the atmosphere. There are no mineral substances in solution in common river water, so deleterious to health as to require removal. Much has been said and written in refer-

ence to the spontaneous purification of river water containing organic substances in solution, but the only safe way is to draw the supply for domestic purposes from a source absolutely free from all excrementitious or other animal matters.

OUR SOURCE OF SUPPLY.

The Cumberland river, from which the city derives its chief supply, is a long, narrow stream, that flows, during much of its course, through a rich agricultural region. The water, frequently muddy, is pumped into a small Reservoir and distributed immediately throughout the city, *without settling or filtration.* The drainage of a portion of the city enters the river above the Reservoir, one portion *directly*, another through Brown's Creek, near the banks of which are the *City Cemeteries.* Judge's Spring, near Lick Branch, Wilson's Spring, and in fact all the springs and wells within the city, are exposed to polluted drainage.

RESULTS OF ANALYSIS.

Careful analysis of water taken from the Reservoir, from Judge's Spring, and from Wilson's Spring, yielded the following results:

SOLIDS CONTAINED IN ONE U. S. GALLON.

	RESERVOIR.	JUDGE'S SPRING.	WILSON'S SPRING.
	Grains.	Grains.	Grains.
Potassic Oxide	0.035	0.102	1.309
Sodic "	0.813	2.368	3.213
Calcic "	2.443	9.147	12.617
Magnesic "	0.273	1.233	1.181
Ferric and Aluminic	0.392	0.105	0.525
Chlorine	0.175	1.750	2.100
Sulphuric Acid (SO_3)	0.274	1.918	3.943
Nitric " (N_2O_5)	0.260	1.912	2.162
Carbonic " (Calculated)	2.452	7.353	9.755
Silicic "	Trace	0.537	0.400
Organic and Volatile Matter	0.973	1.309	1.168
	8.090	27.734	38.373
Less Oxygen equivalent to the Chlorine	0.040	0.394	0.473
Total	8.050	27.340	37.900
Suspended Matter	2.55	.....	.....
Degree of Hardness (Clark's scale)	$5\frac{1}{2}°$	20°	$25\frac{1}{4}°$
" " (after boiling)	$1\frac{1}{2}°$	$4\frac{3}{8}°$	$7\frac{1}{8}°$

These acids and bases, actually found by analysis, are probably combined as follows :

	RESERVOIR.	JUDGE'S SPRING.	WILSON'S SPRING.
	Grains.	Grains.	Grains.
Sodic Chloride	0.288	2.884	3.460
Potassic Sulphate	.....	0.188	2.423
Potassic Nitrate	0.086	.....	.....
Sodic Sulphate	0.486	1.924	3.160
Sodic Nitrate	0.328	.....	.....
Sodic Carbonate	0 562	.....	.....
Calcic Nitrate	.....	2.903	3.283
Calcic Sulphate	.....	1.271	1.783
Calcic Carbonate	4.362	13.630	19.218
Magnesic Carbonate	0.573	2.589	2.480
Ferric and Aluminic Oxides	0.392	0.105	0.525
Silicic Acid	Trace.	0.537	0.400
Volatile and Organic Matter	0.973	1.309	1.168
Total Solids	8.050	27.340	37.900

In the above tabular statements the results are presented in two forms. In the first, the substances are given as found by analysis; in the second, the bases and acids are combined in the form of salts according to the method generally adopted by chemists in arranging the results of a water analysis.

The water from the Reservoir, collected Dec. 27, 1875, when the river was moderately full, deposited, on standing for a few days, 2.55 grains of sediment, or suspended matter, to the gallon, which has not been analyzed. Several species of fresh water Algæ were developed; among others, a species of Nostoc, which extended its thread-like fibres throughout the closely stoppered bottle containing the water, and when subjected to microscopic examination exhibited the cellular structure with occasional sporules common to such plants.

The microscope also revealed numerous sorms of animal life, such as crustaceans of inferior grade, including an abundance of the species known as Cyclops, Cypris, etc., the development of which is by no means uncommon in river water.

These animals and plants doubtless originated in the sediment, and would not make their appearance in river water if properly filtered. No organic forms were observed in the water from the two springs.

The following tabular statement exhibits the purity of the waters analyzed compared with that of other cities:

IMPURITIES CONTAINED IN ONE U. S. GALLON.

CITY.	SOURCE.	INORGANIC MATTER.	ORGANIC AND VOLATILE MATTER.	TOTAL SOLIDS.
		Grains.	Grains.	Grains.
Nashville	Cumberland River (Reservoir)	7.08	0.97	8.05
"	Judge's Spring	26.03	1.31	27.34
"	Wilson's Spring	36.73	1.17	37.90
New York	Croton	3.90	0.66	4.56
Philadelphia	Schuylkill (Fairmount)	2.30	1.20	3.50
Boston	Cochituate	2.40	0.71	3.11
Albany	Hydrant	8.47	2.31	10.78
Syracuse	New Reservoir	12.13	1.80	13.93
Chicago	Lake Michigan	5.62	1.06	6.68
London	Thames	15.53	0.83	16.38
Paris	Seine	7.83	1.00	8.83

It is evident from the above that Cumberland river water when free from suspended matter, compares favorably with that supplied to other cities, while the spring water contains a large excess of inorganic substances. More than half of this inorganic or mineral matter consists of a calcic carbonate or limestone, which imparts to water the quality known as "hardness." This quality of hardness, caused by the presence of salts of lime and magnesia, may be either *temporary* or *permanent*. Pure rain water can dissolve only a minute quantity of calcic carbonate, but when charged with carbonic acid it dissolves this salt in large quantities. By boiling water of this character the carbonic acid is expelled, the calcic carbonate precipitated, and the water rendered almost pure; hence such hardness is said to be *temporary*. The solution of other salts of lime—as, the sulphate—does not depend on the presence of carbonic acid, and hence such salts remain in solution after boiling and produce *permanent* hardness.

The effect of hardness is to decompose soap used in washing, the fatty acids forming insoluble compounds with the lime and magnesia.

By reference to the tabular statement it will be seen that this "hardness," and consequent destruction of soap, is almost entirely removed from the water of the Reservoir by boiling, while

it is greatly diminished in that from the Springs. The water from Wilson's Spring requires about one pound of soap to neutralize the salts contained in twenty-five gallons of the water. Dr. Clark, of England, some years ago proposed a plan for softening calcareous waters by adding sufficient milk of lime to combine with the excess of carbonic acid, and allowing the water to stand in the Reservoir long enough for the precipitate to settle. This plan has been used to some extent in England, but the small quantity of lime in our river water would not warrant the use of such means for its purification.

While the presence of salts of lime and magnesia are very objectionable in water used for washing, it is doubtful whether in moderate quantities they are objectionable on the score of health; In fact, Dr. Letheby, late Medical Officer of Health to the City of London, says in a recent report, "Experience has shown that waters of a moderate degree of hardness, from the presence of calcareous salts, are more wholesome than those which are deficient of such substances."

While, in a sanitary point of view, the amount of organic matter in solution is doubtless the most important constituent, it is to be regretted that the means in general use among chemits for its determination are far from being satisfactory. The old plan of heating the solid residue after evaporation to dull redness, recarbonating, and counting the loss as organic matter, is entirely untrustworthy; and the same may be said of the process which involves the use of potassic permanganate. Among the latest methods proposed and now in use, is that of Frankland, by combustion, and Wanklyn's ammonia process.

According to Wanklyn, whose method it is unnecessary in this connection to describe, a water analysis for sanitary purposes is complete when it includes these data: Total Solids, Chlorine, "Free" and "Albuminoid" Ammonia, and Poisonous Metals.

In the following table these are given, and for comparison the same constituents as found in London waters:

	GRAINS PER GALLON.		PARTS PER MILLION.	
	Solids.	Chlorine.	Free Ammonia.	Albuminoid Am.
Cumberland River (Reservoir)...	8.05	0 175	.00	.03½
Judge's Spring.....	27.34	1.750	.00	.02
Wilson's Spring.....	37.90	2.100	.00	.04
London Water Supply (Thames)	16.38	1.000	.01	.06
Kent Company.....	22.10	.....	.01	.02
Thames, London Bridge, (Very Bad Water).....	.....	.....	1.02	.59

During the winter the amount of ammonia, whether free or albuminoid, resulting from contamination, is likely to be a minimum, and hence such determinations to be of value should be made throughout the year.

It is difficult to determine whether the large amount of nitrates in the spring water results from contamination with the products of decomposing animal refuse, or whether it is derived from some other source. Both springs are so situated that such contamination is not improbable, and may be determined by repeated examinations continued throughout the year.

During the Summer and Fall of 1876, the following determinations were made, showing the variations in the quantity of matter in solution:

WATER FROM THE RESERVOIR.

Date of Collection. 1876.	GRS. OF SOLID MATTER IN 1 U. S. GALLON.			PARTS IN ONE MILLION.	
	Inorganic.	Organic and Volatile.	Total.	Free Ammonia.	Alb. Ammonia.
June 2.....	6.16	.84	7.00	0.00	0.13
July 1	6.75	.75	7.50	0.00	0.09
August 8.....	7.67	1.00	8.67	0.01	0.37
September 20.....	6.67	1.17	8.84	0.01	0.18
October 20.....	6.67	1.00	7.67	0.01	0.10
November 8.....	.....	.....	8.40	0.00½	0.17
September 25*.....	8.14	.70	8.84	0.00	0.03½
October 27*.....	7.41	.29	7.70	0.00	0.04

* From the Island.

WATER FROM JUDGE'S AND WILSON'S SPRINGS.

PARTS IN ONE MILLION.

Date of Collection. 1876.	JUDGE'S SPRING.		WILSON'S SPRING.	
	Free Ammonia.	Albuminoid Ammonia.	Free Ammonia.	Albuminoid Ammonia.
June 2	0.00	0.01	0.00	0.00
July 1	0.00	0.01	0.00	0.01
August 8	0.01	0.05	0.00	0.08

In the above tabular statement the total solid residue was obtained by carefully evaporating in a platinum dish over a water bath a given amount of water rendered clear by standing from eighteen to twenty-four hours. After ignition, the residue was treated with an aqueous solution of carbonic acid, and dried as before. The loss is counted as "organic and volatile matter." Wanklyn's method was used for the determination of "ammonia and albuminoid ammonia." While this process does not give the absolute quantity of organic matter in potable waters, it is in general use amongst chemists, as it affords comparative results of great value in determining the presence of various qualities of nitrogenous compounds injurious to health.

Walkyn & Chapman, in their work on Water Analysis, say that "*filtered* water supplied by water companies, no matter whether derived from a lake, from clear mountain streams, or from defiled rivers, yields from 0.05 to 0.10 parts of albuminoid ammonia per million, and, indeed, if the filtration be efficient, approximates 0.05; when the number rises to 0.10 there is defective filtration. When the filters are overtaxed, as happens in the rainy season and in the winter, water companies supply imperfectly filtered water, in which as much as from 0.10 to 0.20 parts of albuminoid ammonia are found in a million parts of the water; and it is matter of observation that diarrhœa is frequently prevalent in communities which drink such water."

The amount of chlorine varied from one and three-quarters to two-tenths of a grain per gallon.

The water in every instance, except that from the "Island," was carefully collected by myself from the reservoir, in clean glass-stoppered bottles, and examined as soon as possible after returning to the laboratory. To avoid the collection of floating

particles or any portion of the green scum, which at times covered a considerable part of the surface of the reservoir, the water was taken from some distance beneath the surface, by covering the orifice with the thumb and thrusting the bottle as deep as possible into the water before allowing it to enter.

The water, which was generally very muddy, required from one to three days to become perfectly clear, the turbidity remaining much longer at some times than at others. A marked difference will be observed in the amount of "organic and volatile matter" and of "albuminoid ammonia" found in the water collected from the island and that taken from the reservoir. This water was sent to me by Dr. Lindsley, Health Officer of the city, and came from the island, which is situated some distance above the reservoir, where Mr. Wyatt, Superintendent of the Water Works, has proposed to obtain for the city an abundant supply of pure, filtered water. It was perfectly clear, and as the results of the analysis indicate, remarkably free from organic matter. The natural filtration of this water, which is effected by percolation through the large sand and gravel bed composing the island, together with the fact that it is removed from the influence of sewage from the city, seems highly favorable to the project of furnishing the city with an abundance of water remarkably free from organic impurities. A similar plan has been successfully adopted by other cities in this country and in Europe.

At Lowell, Mass., a "filtering gallery," as it is called, is excavated to a depth of about 16 feet down into the natural gravel bed which borders on the river near the city, and into this the water from the river rises, deprived of its suspended matter and in a state of purity which it would be difficult otherwise to obtain.

The impure condition of the water from our reservoir is evident even to the casual observer. The Cumberland, a long, narrow stream, flowing for more than a hundred miles through a rich agricultural region, contains at all times a large amount of suspended matter. The very limited capacity of the reservoir precludes the possibility of the removal of this by settling before the water, pumped directly from the river, is delivered to the inhabitants of the city for drinking and other purposes. That it should be purified by *filtration*, or at least by *settling*, is obvious.

FISH-LIKE ODOR OF POTABLE WATERS.

One result of my investigations has been to furnish an answer to an interesting question, the solution of which has been sought by chemists for several years past. In the following article read before the New York Academy of Sciences, the subject is discussed and the results given:

Much interest has recently* been excited in reference to the cause of various odors incident to potable waters. The October number of the American Chemist contains the Report of Prof. Nichols on a peculiar condition of the water supplied to the city of Boston, in which is given an account of investigations made to determine the cause of an unpleasant taste observed in the water-supply of that city and complained of by the inhabitants. The taste is described as "fishy," though to some persons it seemed like that of "cucumbers." When boiled, the water was observed to have an unpleasant odor, and after again becoming cold it lost the peculiar taste.

Various theories are suggested to account for the taste and odor, such as decaying vegetable and animal matter, animalcula, etc., etc., all of which are pronounced unsatisfactory. The Report says: "In order that the present investigations on this point might be perfectly conclusive, application was made to Dr. Farlon to conduct the observations. Dr. F. is acknowledged to be one of the first authorities in the United States on the lower orders of plants, to which he has specially devoted himself. His Report, which follows, shows that "nothing was discovered either in the water or in the slime which collects on the screens which can be accused of being the cause of the evil." The Report further states "as there is yet no certainty as to the cause of the trouble, it is not, of course, possible to suggest any means either of prevention or cure." A circular from the Executive Board of the city of Rochester, received from Dr. Lattimore, dated Dec. 18, 1876, says: "The water-supply of this city has for some time been affected with an unpleasant taste and odor which may be described in a very general way as fish-like." "It is well known that similar cases are of not infrequent occurrence in other cities, and have often been made the subject of scientific enquiry, but so far as we are informed such investigations have not furnished a satisfactory explanation of the cause of the trouble, or any efficient means of preventing its recurrence."

The above references show the importance of the subject, and in explanation of the cause of the odor and taste referred to, the following observations are submitted:

In the spring of 1876, an investigation of the water-supply of Nashville was undertaken at the request of the Board of Health. My first Report will be found in the American Chemist for July, 1876. Samples of water were taken for analysis from the reser-

*This was written early in February.

voir and from two large springs which are extensively used for drinking and domestic purposes. The water was collected during the summer and fall, about the first of each month, in ground glass-stoppered bottles, and one or more bottles from each source were set aside for special observations on organic growths, should such make their appearance. These bottles have been opened and examined within the past month. In the water collected on the 7th of August, from the reservoir and from one spring, a considerable quantity of algae was developed. A bottle of this was emptied into a porcelain dish, after pouring out a little and thoroughly shaking the remainder. This was allowed to settle, the greater portion of the clear water poured off, and the algae or green mass transferred, as much as possible, to another dish, leaving in the former some brown earthy sediment, with a little water. A day or too after, while making microscopical observations of the water, quite a number of crustaceous animalcula, chiefly cyclops large enough to be seen with the naked eye, were observed in the dish containing the brown earth sediment. In the mean time, the water had completely evaporated from the dish containing the algae. On pouring into it a little distilled water, a strong odor decidedly fish-like was developed. A similar taste pervaded the water. Under the microscope the conferroid filements were much broken, with many of the cells emptied of their contents. Quite an abundance of diatomaceæ, with a few animalcula, were observed. The water was colored slightly green. This experiment has been repeated, and in every case, by allowing the algae to become dry and then adding distilled water, this peculiar odor and taste are developed. Hence it appears to me to be a legitimate conclusion that the fish-like odor and taste are caused by microscopical algae undergoing decomposition.

The Superintendent of the Water Works informs me that he has observed this peculiar odor in the reservoir water and has frequently called the attention of the Engineer to the fact. According to his observation it makes its appearance about the middle of August, when the water is at a low stage, and disappears from the last of September to the middle of October. It has caused no complaint on the part of the citizens, so far as he is aware.

Since the above was written, several Reports have been received, in which the explanation given has been confirmed.

It is hardly probable that the minute quantity of this organic matter necessary to affect so unpleasantly a large body of water, can render it unwholesome; and yet, however minute, it is offensive to the delicate organs of taste and smell, and should be removed. This can only be done, in all probability, by proper filtration.

ON THE

CLIMATE OF NASHVILLE.

By ALBERT C. FORD, M. D.

United States Signal Service Observer.

Climate of Nashville.

Generally speaking, we may say, basing the assertion on a large personal experience and close study of long series of observations made at different points in the country, that the climate of that area of country embraced between the parallels of 35° and 37° 50' N. Latitude, and between the Mississippi river and the Atlantic ocean, is not surpassed by any similar area in the United States in what may be termed general excellence of climate—no extremes are felt. The spring season is early, the autumn protracted, leaving but little winter between, and the heat of summer is not so oppressive in any portion, but that some contiguous upland furnishes immediate and certain relief. It is true that at long intervals epidemics scourge this fair territory, but in the strong light which modern sanitary science has thrown upon the origin and progress of these, it is to be presumed that in *every* case the cause is outside of and apart from any climatic influence, and that it is altogether within the power of man to successfully combat, by proper prophylactic measures, their future progress, and the climate will be found to aid all properly directed efforts to that end. A strong man may be brought to death's door by a sudden attack of cholera morbus, but if the exciting cause is removed, a second attack will not occur. Nature—nature hastens to the restoration, life and vigor are revived, and no lasting damage is done. Epidemic diseases may obtain a foothold, thousands may die, thousands may leave the land, and yet, *remove the exciting cause*, and nature will breed no epidemics, the climate will shelter no fevers, and health and life will claim the land, as in the days of the aborigines, who gave way to us that we might establish civilization, and by falling a little short of true civilization, admit into our society diseases which destroy us like the simoon of the desert. Nashville is situated almost in the geographical center of the western extremity of the area which we have described, and therefore enjoys peculiarly all the climatic advantages. Indeed it may be selected as a representative locality of the region, for while the brisk mountain air and low summer temperature of the east is lacking, so is the fierce

blast of winter and the greater summer heat of the portions farther west. Observations have fully demonstrated the fact that extensive and violent storms proceed in well defined tracks or paths across the country from west to east. The storm tracks having a direct bearing on the study of climate in the vicinity of Nashville are three in number. *First*, and by far the most frequently traversed path is that one beginning in the far northwest, over the arid plains immediately east of the Rocky Mountains, extending in a southeasterly course along the valleys of of the Mississippi and Missouri, eastward over the great lakes, or between them and the Ohio river, and thence northeastwardly to the ocean, most frequently and naturally following the course of St. Lawrence Valley.

Second. That path beginning at the same point as the first and leading southward over the intervening plains to the Texas coast.

Third. That course traversed by the hurricanes and cyclones of the West Indies and the Gulf. These sweep along the Atlantic coast, following the Gulf stream, and extending inland at times from fifty to two hundred miles. It will be seen that a large portion of the country is far away from these well defined storm-paths. The whole State of Tennessee is situated in this belt of calms, and we accordingly find that while the average monthly velocity of wind at stations in this belt is from 2,000 to 3,000 miles, the average monthly velocity at stations within the storm tracks is from 10,000 to 12,000 miles. Here, then, is one great cause of the equable temperature which we find in this region. True the effects of storms traversing the northern path are almost always felt here within a few hours after they are announced in Ohio and Indiana, but in a very modified form, bearing the relation to the storm itself which the little wavelets on the shore bear to the rolling billows directly behind the wheel of the passing steamer. The tornado is peculiarly an inland manifestation, and follows no constant path. It occurs, without reference to the storm tracks, wherever a sufficient amount of heat exists, accompanied by extended and rapid evaporation. The calm belt is therefore as liable to this form of atmospheric disturbance as other portions of the country. These local storms, however, while they are at times very destructive, exert no ap-

preciable influence on the climate, coming and going within a few hours.

With regard to the local topography of Nashville in its bearing upon climate, the elevation upon which the city proper stands is favorable to constant motion in the air, consequent rapid evaporation and a low percentage of relative humidity. The valley of the Cumberland river attracts and promotes local breezes over the city, which I am inclined to believe are also promoted during the summer months by the absence of timber and vegetation generally from the sides of high hills on the southern border of the city. The intense heat radiated from these hillsides during a long summer day must create a partial vacuum near the earth, set an ascending current of air in motion, and draw the surrounding air for some distance to take its place.

Portions of the city proper, where no shade trees exist, have equal or even greater radiated power, though not over a similar extent of surface. The very reasonable presumption that the temperature of the city is higher than that of the surrounding country, was very thoroughly demonstrated during the low temperature of the winter of 1876–7. Observations were taken at that time by Mr. E. D. Hicks, at his residence four miles from the city, on the Northwestern road, and also by Prof. Callender, at the State Insane Asylum, about the same distance from town in a different direction.

Below are given the thermometer readings of Mr. Hicks and the readings at the United States Signal Office in the city. Prof. Callender's readings agree substantially with those of Mr. Hicks:

Date.	Time.	Hicks' Thermometer.	Signal Office Thermometer.
December 30, 1876	9 P. M.	— 2°	11°
December 31, 1876	6 A. M.	—10°	— 2°
January 2, 1877	9 P. M.	Zero.	12°
January 3, 1877	6 A. M.	—17°	— 8°
January 9, 1877	6 A. M.	—18°	— 7°
Mean of five observations. .		—9.4°	1.2°
Mean difference		8.2°	

This mean difference will doubtless hold good as near as may be throughout the year, the temperature of the city being raised summer and winter by artificial causes, about 8° Fahrenheit.

The observations given above are selected from a remarkable period in the history of this climate. No such extreme of cold as that felt in the vicinity of Nashville on the mornings of the 3d and 9th of January, 1877, was ever recorded here before, so far as our information goes. The winter of 1779–80, being the first winter of the settlement of Nashville, is described as "remarkable for its severe coldness," but as the settlers had no "glass," it is not known what degree of cold the thermometer would have indicated.

Prof. A. P. Stewart, of Lebanon, Tenn., recorded at that place in January, 1852, a minus reading of 13.8°, which, up to the last winter, was the lowest recorded temperature in this section. From 1872 to 1875, both inclusive, the thermometer was only once below zero in Nashville, and that once only 2° below. (Records U. S. Signal Office.) Of the other extreme of heat during the summer months, we have an equally satisfactory record. The highest temperature ever recorded here of which we have any knowledge was 104°, August 11, 1874. Subtract from this the 8° for artificial heat, and we have 96° as the maximum limit of temperature during any season. I have read 115° in the shade on the open plain, 700 miles north of Nashville. At the same place in the winter I have read —35°, giving a range of 150°. Taking the absolute limits, so far as we know of our climate, and we find a range of only 112°. The mean annual range is about 90°, while the average daily range is about 19.5°. The winter of 1831-2 was an exceptionally cold one in Nashville. From files of the *Banner*, of that date, we learn that the cold in December, 1831, was unexampled, and that a heavy snow remained on the ground during about three weeks. The thermometer was one degree below zero at "sunrise" on the 12th of that month, and on the 15th at "sunrise" it was ten degres below. Since sunrise occurs about 7 o'clock at that season, and the minimum daily temperature occurs between the hours of 1 A. M. and 4 A. M., it is fair to presume that the mercury had risen several degrees at the time of making the observation.

The next memorably severe winter was that of 1855-6, when the Cumberland river was frozen over for several days, and the thermometer read below zero. Mr. P. F. Tavel, a veteran meteorologist of his time, has left much valuable material to the student of climatology, as his observations extend over a number of

years, and are very complete. The immense strides of meteorological science during the past forty years are very clearly marked in Nashville history, for is it not legitimate history that as early as 1830, some devotee of science, who has not even transmitted his name to us, should have read regularly at "sunrise," again at "noon," and once more at "sunset," each day, the height of the mercury in the thermometer? This record, believed to be the original meteorology of Nashville, was kept by some person and published in weekly installments in the *National Banner*. Later, Mr. Tavel furnished the press of the city with a report containing three daily thermometric observations, and the average state of the weather during the day, also the condition of the Cumberland river, whether "rising," "falling," or "on a stand." These were followed by other observers, who measured rainfall, and gave direction of wind in addition. Then came Prof. Stewart, of Lebanon, with barometer readings, "corrected for temperature, but not for elevation above the sea." Following this came the Government system which we have now, and which is growing and spreading year by year, so that already the earliest reports, when compared to those now issued, appear to belong to the meteorology of another age.

In a strictly sanitary view the Cumberland river has a decided influence upon the climate of this city. So much, indeed, that your Board now publish regularly the daily stage of water in that stream.

In the spring of 1874, during the month of April, this stream overflowed its banks and considerable portions of the city both north and south of the square. Great inconvenience resulted to those persons inhabiting the submerged districts, but the actual damage to property was small. What it may have been to life and health it is impossible to say with accuracy, though probably in much greater proportion. From information to which we are indebted to Mr. Anson Nelson and the "American" library, we learn that there was a freshet in the Cumberland River in 1808; others in 1826 and 1842, and in March, 1847, and December of the same year, freshets occurred which caused a great deal of suffering among the poor who lived on the inundated territory. The March rise of that year was two feet higher than the flood of 1842, and almost as high as that of 1826. The December

rise was twenty inches higher than that of 1826, and the highest water of which we have any record. The high water mark of 1847, on a Broad street building, is four feet higher than the high water mark of 1874, and fifty-four feet above extreme low water in the river.

The guage at present used for measuring the depth of water has a range of 48 feet from extreme low water. In 1874 the top of the guage was two feet under the water. A considerable freshet occurred in 1865, but we have no record of the extreme height reached by the waters. Hardly a year passes but the river becomes comfortably full, and even threatening, yet the memorable overflows do not occur more than once in a decade. The lowlands to the north of the city begin to overflow at about thirty feet on the present gauge, though the "danger line" is fixed at 42 feet. This danger line or point is meant to indicate the existence of actual danger to surrounding property by the rising water.

In considering the atmospheric tides of this region, we find something approaching the ebb and flow of the ocean tides. The sun heats up the earth on the western plains, and the air is driven rapidly and steadily upward. This invites the air from the Gulf and Atlantic, causes south and sout-east winds which come, vapor-laden, to replace it, and a storm is produced by the rapid condensation of this vapor; latent heat is liberated, and the storm eats into the moist current not unlike a fire consumes the grass on a prairie. As the storm progresses over its course, the cold air from the north and north-west being heavier than the southern currents, presses after it, and when the storm passes the cold wave spreads over the country and drives the warmer one into the sea. This process is constant, winter and summer. In Tennessee it causes two great air currents, the warm from the south or south-east, and the cold from the north and north-west. Precisely in the ratio of strength and duration of these currents do we find our range of temperature increase. This ebb and flow regulates also the amount of precipitation, which is a very important item in the history of climate. All, or nearly all, of the rain which falls in this region is brought by the warm currents from the Gulf or Atlantic Ocean. It is brought down in the form of rain or snow, either by the cold of elevation or the pro-

gressive north wind following a storm. When the latter occurs we see the wind suddenly change, after rain has been falling a few minutes, from south-east to north-west. The average rainfall of this section is 52 inches annually. This is distributed very equally among the twelve months, the first six months having generally a small amount in excess of one-half. In 1874 the annual precipitation in Nashville amounted to 58.14 inches, 11.84 inches falling in the month of April. In 1876 the amount was 46.91 inches in the year. These are extremes, and are probably not reached more than two or three times during a century. Snow is rare, and when it falls soon disappears. Snow fell in December, 1876, to a depth of 13 inches, and traces remained three weeks after the first fall, the snow at no intervening time having entirely disappeared. This was considered phenomenal, and taxed the memory of the oldest citizen to parallel.

Whether the amount of precipitation in the city differs materially from that in the adjacent open country, is a question which cannot be considered settled by the data which we have at hand. Mr. Hicks has kept a record of rainfall at his residence near the city, and the comparative table given below, where his observations are used, shows a much less quantity in the suburbs than in the city. This result, however, might not be obtained if several outlying points were selected and observations continued over a longer period, as we see at present no reason for any difference.

RAINFALL TABLE.

DATE.	1875.		1876.	
	COUNTRY.	CITY.	COUNTRY.	CITY.
January	3.83	6.15	5.66	6.41
February	2.15	3.06	1.35	2.22
March	7.55	8.14	3.20	5.28
April	2.16	4.25	2.30	3.62
May	1.73	1.73	4.20	3.40
June	3.00	5.63	2.10	5.65
July	7.66	8.12	5.90	7.15
August	2.07	1.60	4.60	5.77
September	2.06	3.79	1.72	2.52
October	2.60	1.25	2.81	2.68
November	4.15	5.46	1.05	1.26
December	2.90	4.30	97	.95
Total	41 86	53.48	35.86	46.91

Very full and complete tables are appended hereto, covering the main portion of the work done by the United States Signal Office in this city during the period for which this report is intended. Observations on diathermancy, terrestrial and solar radiation, ozone and atmospheric electricity, have been made, but not with such consecutiveness and duration as to elicit any information which is deemed of practical importance. The allotropic state of oxygen known as ozone exists in the city atmosphere in very small amount, the most delicate tests failing to show its presence except during and immediately following a severe thunder storm, or directly after the prevalence of high winds, when other favoring conditions are conjoined, as clear dry air, sunshine, etc. Our limited knowledge of this powerful agent forbids us saying that its absence is prejudicial to health, for may not the very fact of its non-existence lead us to believe that it has neutralized and formed inocuous compounds with poisonous gases which are generated in cities?

We have presented to us in this subject of ozone, and its relation to health and disease, a most fertile field for research, and with commendable promptness your Board has moved in the direction toward securing the registration of its amount daily, and with accuracy throughout the country. At the meeting on June 30, 1876, the following resolutions were unanimously adopted by the Board of Health of Nashville:

Resolved, That the meteorological observations made by the United States Signal Service here and at other points are of the highest value to the physician as well as to the agriculturist and merchant.

Resolved, That the value of the observations, in a sanitary point of view, will be greatly increased by proper registration of the variations of ozone in the atmosphere.

Resolved, That the Chief Signal Officer be petitioned to supply the Nashville Station with the necessary means for such registration.

This action on the part of the Board was duly cummunicated to the authorities in Washington, and answer received that while the Department would gladly extend the service in this direction, it would be unable to do so at present in consequence of the experimental nature of the service, and the inadequate appropriations made for its support by Congress. Time will remedy this defect, and a few years at farthest will find the registration of

both ozone and atmospheric electricity added to the duties of the Signal Service Observers.

In conclusion, I would repeat what has been said before, that the climate of Nashville is not surpassed by that of any other section of the country. People are too much inclined to think their own particular climate the most abominable in the world. Travelers at all times and seasons give most glowing accounts of the climate of other countries or sections, and straightway we fall into the error of making odious comparisons. Travelers have the new and varied scenery to enchant them (largely by its newness and variety), they visit only at the most favored seasons, and are frequently that class who go for pleasure, determined to look on the bright side.

The United States Signal Service is gathering a mass of material which will, in a few years, furnish facts in regard to the climate of this country superseding in fullness and accuracy all previous collections. When sufficient data has been accumulated to warrant its publication, we have no doubt that the good opinion herein expressed of the Tennessee climate, as compared with other sections of the country, will be fully borne out. Indeed, we account this hastily prepared sketch but a forerunner of what is confidently expected in the future.

BRIEF

ANNALS OF NASHVILLE.

By ANSON NELSON,

Recording Secretary of the Tennessee Historical Society.

To the President and Members of the
Board of Health of the City of Nashville:

GENTLEMEN:—In compliance with your request, I take pleasure in presenting you with the following synopsis of some of the principal events in the history of Nashville.* The compilation of facts embraced from the earliest settlement to the year 1850, was made by the writer for Williams' City Directory for 1860–61, and published at that time. What was then written has been condensed in this sketch, and many items omitted entirely, for the reason that but a limited space is now allowed, which must include not only that period, but twenty-seven years more

He is greatly indebted to the proprietors of The American office for the use of their extensive and valuable files of newspapers—the most valuable in the State. Without these files, the facts collected could not have been obtained. Duplicates of these bound volumes were not long since purchased by the Smithsonian Institute, at $450—a very small sum for such a large number of newspaper files, running back so many years.

Facts are mentioned in the briefest possible manner, and many things of more or less interest are passed over entirely, for want of space and of time to search out the data. No reference is made to subjects which are considered in the excellent reports of your Health Officer on the sanitary condition and wants of the city; of Major W. F. Foster, on topography; of Prof. Safford, on geology; of Prof. Lupton, on the water supply; of Dr. Ford, on the climate and climatic influences of this region, etc.

While the sketch has been hastily prepared, at odd hours from more pressing duties, the writer thinks that the facts and dates presented are correct and reliable, and hopes that the paper will prove satisfactory to you and to all others who may take the trouble to read it.

Very respectfully, A. N.

---

*It is gratifying to know that arrangements have been made to print the papers in this pamphlet (except the report of the Health Officer) without expense to the city treasury. Private enterprise has accomplished the work.

BRIEF ANNALS.

Very large tribes of Indians must have occupied the country around Nashville for many miles, and possibly for several hundred years previous to the seventeenth century. This is attested by the numerous places of interment for the dead, covering several acres in each place. An immense "burying ground" was on Harpeth river, another at the mouth of Stone's river (not many miles from the city), another in what is now North Edgefield, just across the Cumberland, another in what is now North Nashville, and still another in and around the sulphur spring bottoms, in the city. In fact, at almost every lasting spring, graves can be found all over this section of country.

So far as we know, the Suwanee, or Shawnee, tribe were the original possessors of the soil, but were driven out by the Chickasaws and Cherokees, who made it a hunting ground for all the tribes, until the whites came and took possession.

A Frenchman, whose name we do not know, was here as a trader in 1710, who had a cabin or trading post near the river, a little north of the Lick Branch. Living with him was a lad about fifteen years of age, named Charles Charleville, who eventually succeeded the Frenchman in business, and who died at the age of eighty-four. When the first American hunters came here, which was in 1770, or thereabouts, they found Mons. Timothy De Mon Breun, occupying the place left by Mons. Charleville. Hence the name of French Salt Lick was given to the Sulphur Spring. Mons. De Mon Breun lived here for many years, and died in 1826, at a good old age. His descendants, the Demonbreuns, are still with us, and Demonbreun street was named in honor of the venerable Timothy.

The first white settlement made in Nashville, was in the winter of 1779–80, a winter remarkable for its severe coldness. The immigrants crossed the river, with their baggage and cattle, on the ice. General James Robertson headed one party, John Rains another, from North Carolina. A small party from South Caro-

lina soon followed. Captain John Donelson's party, from the settlements in East Tennessee, arrived in the spring of 1780. A few rude cabins were built where the city now stands, whilst others were erected in the vicinity. Necessity soon compelled them to erect forts, and the principal one was built at the foot of Church street, near the upper wharf, because a large, bold spring gushed out from the bluff. This post was agreed upon as the headquarters, and the name of Nashborough was given to it, in honor of General Francis Nash, of North Carolina, who was mortally wounded in the battle of Germantown, October, 1777. It was at this fort that a compact for their self-government and protection was voluntarily entered into, on the memorable first day of May, 1780. This compact, or form of constitutional government, can be found in Putnam's "Life and Times of General James Robertson."

In the summer of 1780, Robert Gilkie sickened and died, and was the first man of the white settlers that died a natural death. Philip Conrad was killed by a tree falling on him, near the junction of Cherry and Demonbreun streets, the same summer.

Captain Lieper was the first man married in the settlement, and his was the first wedding west of the Cumberland mountains. The ceremony was performed by Col. Robertson, who was at the head of the Government of Notables, in the summer of 1780. No spirits were used on the occasion, although there was a feast and dancing. The great delicacy for the ladies was roasting ears, while the men eat dried meat, buffalo tongues and venison.

The first male child born in Nashville was Felix Robertson, whose birth occurred on the 11th of January, 1781. He became a noted physician, was mayor of the city in 1818, and also in 1827 and 1828.

The Government of Notables, of which John Montgomery was the first sheriff, and Andrew Ewin first clerk, passed away in 1783, and the State of North Carolina spread her motherly wings over the settlers, and established an Inferior Court, vested with extraordinary powers. A court-house and prison were ordered to be erected—of hewed logs!

The first survey of lots in the new town was made by Thomas Mulloy (for whom Mulloy street is named), in 1784. The origi-

nal copy of the survey was lost, and Mulloy made another survey in 1789 for Judge John Overton, a copy of which is now in the archives of the Tennessee Historical Society.

The first physician made his appearance in 1785, in the person of John Sappington, who compounded pills, covering them with mystery and a coat of sugar, and they were extensively used and known as "Sappington's pills." They had a wonderful reputation. Lardner Clark, "merchant and ordinary keeper," was the first man to open a dry goods store in Nashville, which he did in 1786. His stock of goods was purchased in Philadelphia, packed on ten horses, and came through the State of Virginia, East Tennessee and part of Kentucky. Mr. Clark's goods consisted of cheap calicoes, unbleached linens and coarse woolens; and he combined liquor selling and tavern keeping with his dry goods operations. Wearing apparel, until then, was composed almost entirely of dressed skins. Other licensed taverns were soon opened, and rates of charges for food and spirituous liquors were established by law.

In 1787, the twenty-six one-acre lots, which had been sold for four pounds each, North Carolina currency, were taxed at one dollar—total, $26. This was the first assessment of real estate.

In 1788, the Constitution of the United States, which had been adopted by ten States, was voted upon by this settlement and almost unanimously rejected. In 1789, North Carolina adopted the Constitution. The State of Franklin arose in East Tennessee, and then expired, and all wheeled into line as members of the confederacy of States.

January 12, 1789, Andrew Jackson was admitted as an attorney at law, and was appointed Attorney General in 1790.

In 1796, the first church was erected in Nashville, on the Public Square, near the court-house, jail and stocks. It was known as the Methodist Church, and was torn down or removed in 1807 or 1808.

In 1796 or '97, Thomas Bailey, an Englishman, reached Nashville from Natchez, passing through these western wilds on a tour of observation. After returning home, he wrote an account of his journey, and in speaking of Nashville and the early settlers, he mentioned the fact that he saw more wheeled vehicles here than any one could have supposed in such a new, wild set-

tlement. He said the early settlers were strong-minded, as well as strong-bodied, and capable of carrying on a government of their own if need be. He said they were becoming wealthy, and were rapidly improving in education, manners and dress. Mr. Bailey was afterwards the first President of the Royal Astronomical Society of London.

In May, 1797, three dashing young Frenchmen arrived in Nashville, who attracted a good deal of attention, and afforded the greatest joy to old Mons. De Monbreun. They were brothers, sons of the Duke of Orleans, and the eldest was subsequently known as Louis Philippe, King of France. They left here in a canoe, proceeding down the Cumberland river to the French settlements in Louisiana.

The first newspaper published in Nashville was "The Tennessee Gazette and Mero District Advertiser," in 1797, by a printer from Kentucky, named Henkle. The following year he sold the paper to Benjamin J. Bradford, who changed the name to "The Clarion," and soon after sold it to his cousin, Thomas G. Bradford. The Historical Society has a copy—No. 81, vol. 2, bearing date November 2, 1801—of "The Clarion," though not in a good state of preservation. The Clarion was afterwards enlarged, and called "The Clarion and Tennessee Gazette," by a union of the two papers. In 1807, another paper was published here, called "The Impartial Review and Cumberland Repository."

In 1801, the town was placed under the government of an Intendent and six Commissioners, and a law was passed by the General Assembly at Knoxville, to authorize them to build a market-house. Water street was laid off and opened this year. In 1804, the population was four hundred, and the Legislature empowered the authorities to sink a well on the Public Square, and also to draw a lottery for the extension of the northeastern boundary of the lots on Water Street to the Cumberland River. The Commissioners were authorized to make certain deeds, etc.

Aaron Burr arrived in Nashville May 29, 1805, and was the guest of General Jackson. A public dinner was given him, and he was caressed and toasted by every one. He came again August 16, the same year, and had great honor and attention paid him, and was again the guest of Jackson. But when his schemes be-

gan to be developed, his name became odious, and he was burnt in effigy by the citizens in the autumn of 1806.

In 1806 the town was incorporated, with a mayor and six aldermen. Joseph Coleman was the first mayor, and held the office for three years. Charles Dickinson was killed by General Jackson, in a duel, this year.

In 1810 the population was 1,100. The Legislature assembled here for the first time. It subsequently met in Murfreesboro', Kingston, Knoxville, etc., until its final location in Nashville.

In 1811 and 1812, a great many men volunteered for the war against Great Britain. Thomas G. Bradford printed, in 1812, a book entitled "The Military Instructor," containing Baron Steuben's tactics. Four years afterwards "Clark's Miscellany, in Prose and Verse," was printed.

In 1813, the celebrated fight between Jackson and Hays, and the Bentons, took place at the City Hotel.

General James Robertson, the old pioneer, died on the 1st of September, 1814, universally regretted.

The volunteers from the Creek campaign returned in May, 1814, and a public dinner was given them at the Bell Tavern. Felix Grundy delivered an address of welcome, which was responded to by General Jackson on behalf of the volunteers.

The Nashville Female Academy was incorporated in 1816, and had a successful career from that period until 1861, when the operations of the late war destroyed it. The Rev. Dr. C. D. Elliott was its honored conductor for many years previous to its cessation. Thousands of the best ladies in the South were graduates of this excellent institution.

In the spring of 1818, the people hailed the arrival of the first steamboat at this port. She was 110 tons burthen, built at Pittsburg for General William Carroll, and was named "General Jackson." He sold the boat for $33,000 to Messrs. Fletcher, Young & Marr. Freight from here to New Orleans was then five cents per hundred pounds. In the course of two or three years the steamboat business increased considerably, wharves were built, and commission and forwarding houses were opened. The pioneer boat was snagged and sunk in Harpeth Shoals, June 20, 1821. The steamers "General Robertson," "Rifleman," "James Ross," "Fayette," and "Feliciana," were running the

river, but the latter boat exploded near Eddyville, May 3, 1821, and six or seven lives were lost.

President Monroe arrived in Nashville on the 6th of June, 1819, and was the guest of General Jackson, as was also Major General Edmund P. Gaines, at that time. A public reception was given to the distinguished visitors, addresses of welcome, a public dinner, a ball, etc. Wilkins Tannehill made the address of welcome on behalf of the Masonic fraternity, Hon. John H. Eaton on behalf of the city, and Col. Williamson on behalf of the military. The President took his departure on the 11th, through Kentucky, accompanied by General Jackson as far as the residence of Col. Richard M. Johnson, in that State.

The financial panic of 1819–20 caused the Farmers' and Mechanics' Bank to suspend specie payments on the 18th of June, 1819, which example was followed by the Nashville Bank on the 22nd, and the Bank of the State of Tennessee on the 29th. The Legislature was convened at Murfreesboro', by Gov. McMinn, and the Bank of the State of Tennessee was chartered, with a capital of one million of dollars, with a branch at Knoxville.

A substantial and elegant bridge was built across the river from the northeast end of the Square to the Gallatin Turnpike, in 1822, at a cost of $85,000. It was taken down in 1855, because it obstructed navigation. It is said to have been the best bridge that ever spanned the Cumberland.

In 1822, the City Cemetery, on South Cherry street, was opened for interments. The Sulphur Spring bottoms had been previously used as a burying ground.

In 1823, the population was 3,460, and in 1830, 5,566.

In 1825, there were from 15 to 20 steamboats running from Nashville to New Orleans, Louisville and Pittsburg.

Gen. Lafayette, son and suite, arrived here on the 4th of May, 1825, and were received with the greatest demonstrations of joy. An immense procession was formed, the streets were decorated with arches of evergreens, and patriotic mottoes were inscribed upon them. The General landed on the grounds of Maj. Wm. B. Lewis, above the Water Works, where Gen. Jackson and a number of citizens received him, and Gov. Carroll addressed him in behalf of the State, tendering him a welcome to Tennessee. The procession, with the military, escorted him into the

city, where Robert B. Currey, Esq., the Mayor, addressed him in behalf of the city, and tendered him its freedom and hospitality. The joy of the people knew no bounds, and Gen. Lafayette ever after spoke of his reception in Nashville as one of the most pleasant events of his life. He was taken to the residence of Dr. Boyd McNairy, who threw open his doors to the distinguished visitor and his suite. The next day the General went to the Masonic Hall, where he received the ladies of Nashville in that polite and cordial manner for which he was remarkable. A public dinner was given him at the Nashville Inn, at which Gen. Jackson acted as President, assisted by George W. Campbell, Henry M. Rutledge, John Somerville and Felix Grundy, as Vice Presidents. Our old friend Timothy De Monbreun was at this dinner, and was toasted by Col. Andrew Hynes, as the patriarch of Tennessee, and the first white man that settled in the country. Gen. L. visited the Grand Lodge of Tennessee, the Royal Arch Chapter, and the Masonic fraternity generally, and welcomed by Wilkins Tannehill, Esq., as a friend and a brother. A collation was furnished on the occasion, and all hands had a "good time" generally. Before his departure, the General called on Mrs. Jackson, Mrs. Littlefield, (the daughter of his old companion and friend, Gen. Green, of Revolutionary memory,) Gov. Carroll, Rev. Dr. Philip Lindsley, and others.

Over one million of dollars worth of cotton were exported from this port in 1825. The Branch Bank of the United States was established in 1827.

The city was divided off into six wards in 1826.

In 1829-30, our physicians commenced using quinine in fevers, and Dr. Felix Robertson has the credit of introducing it here.

The highest state of political excitement existed here in 1832, on the subject of nullification.

The city received a wonderful impetus in the way of business and progress in every department in 1830-31-22, and part of 1833—checked then by the first visit of cholera to this city.

Christ Church was built in 1831-32, at a cost of only $16,000. The McKendree Church was built in 1832-33, and dedicated the last Sunday in 1833. The Cumberland Presbyterian Church was dedicated in May, 1832. The first Catholic Church on the north side of Capitol Square, was built in 1830-31. Rev. Dr.

Edgar was installed as pastor of the First Presbyterian Church, December 25th, 1833, and was its pastor for nearly twenty-eight years. A Baptist Association was formed here in 1820.

The Union Bank of Tennessee was chartered in 1832, and went into operation in 1833. The Planter's Bank was chartered in 1833, and went into operation in 1834. The Tennessee Marine and Fire Insurance Company was chartered by the Legislature in 1833, and its capital stock subscribed in twenty minutes—no person being allowed to subscribe over $5,000 of stock in his own name. The steamboat "Lady Jackson," of 200 tons burthen, was built at our lower wharf, and launched August 4th, 1832. The penitentiary was built by the State in 1830-31. The Lunatic Asylum was built in 1833-34, south of Vauxhall garden. Vauxhall garden was a place of considerable resort for political meetings, social gatherings, etc., of the most respectable character.

The First Baptist Church was built in 1837. Rev. Dr. R. B. C. Howell was its pastor, and occupied that position over a quarter of a century.

The establishment of the Water-works was decided upon by the Board of Aldermen in 1831, and the work soon commenced. It was completed in 1833, and began to furnish a supply of water on the first day of October of that year. The cost was $55,000. The engine was built at West Point, New York. A new engine was built in 1853, in Nashville and Pittsburg, at a cost of $50,000. Much additional expense was incurred to enlarge the reservoirs, engine-house, etc. This engine, put to work in 1853, is still in use, but nearly worn out. The city authorities have contracted with Dean Brothers, of Indianapolis, for two sets of new engines, which are now being built at a cost of $26,000, and are to be put to work on the 10th of November, 1877. The enlargement of buildings, connecting pipes, etc., (work now going on), will cost $20,000 more. The new engines will be capable of furnishing the city with ten millions of gallons of water every twenty-four hours. The new stand-pipe, to be used in connection with the new engines, will be one hundred feet high, which will raise the water ninety feet above the present reservoir. There are now over forty-nine miles of water-pipe laid in the

streets of the city, and the average consumption of water amounts to two millions of gallons for every day in the year.

Our people, and the Mayor and City Council, have been for some time past exercised in regard to the muddy water obtained from the river, and various suggestions have been made to remedy the evil. Captain James Wyatt, our excellent and efficient Superintendent of the Water-works, last year devised a plan by which to run the water into the city from the upper island, so as to use the island as a filter, and by means of which only clear water will come into the reservoirs and the city. This plan has been adopted, and a contract for the work will be made early in September, 1877. It is supposed that this great improvement will cost about $70,000. The cost of the water-works, pipes, fire-plugs, etc., to the city, considerably exceeds one million of dollars. There are two hundred and eighty fire-plugs in the city.

Duncan Robertson, who came to Nashville in 1806, died May 1st, 1833, aged 63 years. He has the reputation of having been the best man that ever lived in Nashville. "In imitation of his Divine Master, he literally went about doing good."

The Convention to revise the Constitution of the State, met in Nashville on May 19th, 1834.

Our townsman, W. B. Cooper, the artist, painted the portrait of Hon. John McLean, of the U. S. Supreme Court, who was holding Court here at the time.

The steamer "John Randolph" was burnt at our wharf on the 16th of March, 1836. Three lives were lost, and over $200,000 worth of goods was destroyed. This was one of the largest and finest boats in the trade, and was owned by J. & R. Yeatman & Co.

General Armstrong's brigade met an enthusiastic welcome on their return from the Florida campaign, February 4th, 1837.

The House of Industry, for females, was established in 1837, About this time, (date not known), the Sisters of Charity founded their hospital.

The great financial revulsion of 1837 caused the banks to suspend specie payments, and a considerable depreciation in the price of real estate took place. A great many persons left the State, the majority for Texas, bankrupt.

The Hon. John Catron received his appointment as one of the Supreme Judges of the United States in 1837.

The Hon. Hugh Lawson White died at Knoxville on the 10th of April, 1840, and a public meeting was held here on the 15th, to testify the respect of our people for his memory. He received the electoral vote of Tennessee, in 1836, for President. He was one of the purest statesmen this country has produced.

Soon after the tornado at Natchez, in May, 1840, the citizens made contributions to the sufferers, and C. C. Trabue, Mayor, forwarded them $1,500.

The I. O. O. F. made their first public parade on the 1st of June, 1840.

The great Whig Convention was held on the 17th of August, 1840. Henry Clay was present, as well as many other distinguished visitors.

The Hon. Felix Grundy, the best criminal lawyer in the Southwest, once United States Senator, and Attorney General in Mr. VanBuren's Cabinet, died at his residence in Nashville, on the 19th of December, 1840.

A series of popular lectures were delivered in the Masonic Hall in the winter of 1840-41, under the auspices of a library society then in existence. The Rev. Dr. Phillip Lindsley, the Rev. Dr. R. B. C. Howell, Prof. Gerard Troost, Dr. Thomas R. Jennings, Prof. Nathaniel Cross, Prof. J. Hamilton, Rev. Dr. John T. Edgar, Hon. Abram P. Maury and others, were the lecturers, and the course was remarkably successful.

A large public meeting was held in April, 1841, in relation to the death of Gen. Harrison.

Ex-Governor Newton Cannon died in 1841, and his death was appropriately announced in all the courts, and a public meeting held, which fittingly expressed the sorrow of the community.

The first daguerreotype likenesses taken in the city were by an artist named Moore, who stopped at the Union Hall Hotel, in 1841, and had quite a run of custom for a short time.

Mr. Clayton, the celebrated æronaut, made a successful balloon ascension on the 13th November, 1841.

The Morus Multicaulis excitement raged in this section in 1840-41-42; and a silk manufacturing company was established here, but subsequently failed.

Ex-President VanBuren arrived here April 25th, 1842, and the next day, in company with his traveling companion, James K. Paulding, went out to the Hermitage to see Gen. Jackson. They all came into the city two days afterwards, and had a grand reception. A public dinner was offered and declined. Mr. VanBuren went from here to Columbia to visit Ex-Governor Polk. He returned and took his departure for Lexington to pay a visit to Henry Clay.

The banks, which had suspended specie payments in 1837, resumed in August, 1842.

A shock of an earthquake was felt on Wednesday night, January 4th, 1843, and another on the night of the 16th.

Payne, Carroll and Kirby, for the crime of murder, were hung on the commons, then south of the city, (now in the 8th Ward), February 10th, 1843.

The Fourth of July, 1843, was celebrated with unusual vigor and animation.

Marshal Bertrand, of France, arrived on the 29th September, 1843. He was accompanied by his son, Napoleon Bertrand, and his aid, M. Mansoe. After visiting the Hermitage, the party partook of the hospitalities of Chief Justice Catron. They returned the visits of Gov. Jones, Gen. Carroll, Gen. Armstrong and C. C. Norvell, editor of the *Nashville Whig*.

The seat of Government was permanently fixed at Nashville on the 7th of October, 1843, after a severe struggle in the Legislature. The city bought Campbell's Hill for the State House, at a cost of $30,000, and gave it to the State.

Major Henry M. Rutledge, only son of Hon. Edward Rutledge, one of the signers of the Declaration of Independence, died at the residence of his son-in-law, Hon. Francis B. Fogg, January 20th, 1844. The Legislature, and all the courts of law then in session, adjourned, and participated in the formal obsequies. Thomas Crutcher, who had been a citizen here for half a century, died on the 8th of March, 1844, and had the largest funeral procession that had ever been seen in Nashville. He was a benevolent, good man, the best friend the Nashville Female Academy ever had, and in life had occupied several positions of trust and honor. Wm. McNeill, who had been a resident here for more than half a century, died on the 21st of the same month;

and on the next day Gen. Wm. Carroll expired. He had lived here thirty-four years, twelve of which he was Governor of the State. His military services are well known to the country. The death of these old and esteemed citizens, following so closely one upon another, caused a profound sensation among our people, and the writer well remembers that the morning after the death of Gov. Carroll, he went to Capitol Hill at daylight, for purposes of meditation, where he was soon joined by the memorable Robert Farquharson (himself an old resident), who spoke feelingly of the rapidity of Death's doings, and lamented the departure of friends who had been so long familiar to himself and the people of the city. He mentioned many, many changes on these streets since he first came here, and remarked that "you young men will see greater changes than those in half the time, but whether for the better or not, is doubtful." The conversation, though brief, made a strong impression. On the 6th of April, the mortal remains of Senator Porter, of Louisiana, arrived here for interment among his relatives.

The Institution for the Instruction of the Blind went into operation early in 1844, the Rev. Dr. Edgar, the Rev. Dr. Howell, and the Rev. John T. Wheat acting as trustees under an appointment from the Governor.

The corner-stone of the Second Presbyterian Church was laid April 25th, 1844.

The Presidential campaign of 1844 was characterized by an excitement little less than that prevailing in 1840. Large meetings, by both political parties, were held, and most of the distinguished political speakers in the United States were here at one time or another during the campaign.

The steamer "Belle of Clarksville," a Nashville boat, was sunk in December, 1844, by which thirty-three lives were lost, principally deck hands. The accident occurred near Old Town landing, on the Mississippi river. For several years the merchants and business men of Nashville owned the largest and finest boats that floated on the bosom of the Mississippi.

Hon Thomas H. Fletcher, who had lived here from 1809, died of appoplexy, alone in his office, on Sunday, January 12th, 1845. He was a successful lawyer and writer of ability.

Col. Robert Weakley, who had occupied many posts of favor

in military and civil life, and who had arrived here before a single house had been built, died at his residence in this county, February 3d, 1845.

In April, 1845, our citizens contributed nearly $1,200 for the relief of the sufferers by the great fire at Pittsburg.

Louis Philippe, King of France, sent the artist Healy to paint the portrait of Gen. Andrew Jackson. The portrait was completed in May, 1845.

Gen. Andrew Jackson died on Sunday evening, the 8th of June, 1845, and various meetings were held on the subject. Gen. Sam. Houston, of Texas, arrived here the same day, but reached the Hermitage after the death of his distinguished and life-long friend. His funeral was attended by an immense number of people.

The corner stone of the Capitol was laid, with imposing Masonic ceremonies, on the 4th of July, 1845. Hon. Edwin H. Ewing was the orator on the interesting occasion. Wm. Strickland was the architect. The Board of Commissioners, of which our fellow-citizen, Samuel D. Morgan, was chairman, and who devoted a great deal of time personally to the work and the purchase of material for its execution, received the appropriations made by the State, from time to time, and faithfully accounted for every cent expended. The State required no security or bond from her Commissioners, and no thought of dishonesty, mismanagement, or negligent waste was entertained on either side. Col. Morgan yet has possession of the books containing an account of the expenditures for the entire work. The building is a parallelogram, 138 by 238 feet, with an elevation of 74 feet 8 inches above the ground. It has four fronts, each side graced with noble porticoes, supported by twenty-eight Ionic columns in all, four feet in diameter, thirty-three feet high. The house contains a large chamber for the use of the House of Representatives, another chamber for the Senate, rooms for the valuable State Library (in one of which are the curiosities, relics, and papers of the Historical Society of Tennessee), rooms for all the State officials, committee rooms, and in the basement the State Arsenal. The entire height of the building, from the ground to the top of of the tower, is two hundred and six feet five inches. Cost, something over one million of dollars. The architect, Mr.

Strickland, died on the 7th of April, 1854, and his funeral services were held in the hall of the House of Representatives. He was entombed in a recess in the north-east corner of the building, left by himself for that purpose. He lived to see his work nearly completed. The last stone of the tower was laid on the 21st of July, 1855, and the last stone of the lower terrace on March 19th, 1859. Work has been going on either on the building or the grounds, to a greater or less extent, nearly ever since. The entire work, with the adornment and arrangement of grounds, fencing, walls, gate-ways, etc., are now about completed, and presents a beautiful and tasteful appearance, with one of the most commanding views, from the tower as well as the rooms, that can be found in the United States. Time and space prevent a more detailed notice of this great work of art—the pride of every Tennessean.

Gen. Robert Armstrong, who had been Postmaster here from 1829 to 1845, resigned that position, having been appointed Consul to Liverpool by President Polk.

John Somerville, who came to Nashville in 1799, and who had occupied various positions in the Banks of the city, and especially as Cashier of the Union Bank, died in April, 1846.

The war with Mexico, and a call for volunteers, caused the organization of a great many military companies through all this section, not one-half of which could be received. The two military companies here were fortunate in being accepted, owing to their military training. Several of the Mexican veterans remain with us, though a large number of those who first went were killed in battle, or died from sickness. The living returned in June, 1847.

Major Joseph Norvell, who founded the Nashville Whig in 1812 (in connection with his brother Moses Norvell), and who was for several years City Treasurer, and P. G. M. of the Masonic Grand Lodge, died on the 7th of January, 1847.

The sum of $3,600 was raised for the relief of the starving population of Ireland, in the spring of 1847.

On the 12th of October, 1847, a powder magazine, situated west of Capitol Hill, was struck by lightning and exploded, by which four persons were killed and twenty wounded. Fifty houses were demolished, or rendered unfit for use, and the de-

struction of window glass in the city and in the suburbs was immense.

The first telegraphic dispatch received in Tennessee was in March, 1848, on Henry O'Reilly's line from Louisville to Nashville, and Mr. O'Reilly sent his compliments to the people of Tennessee, among the first dispatches.

On the 14th of September, 1848, the First Presbyterian Church was a second time destroyed by fire, on the site of the present large and elegant church edifice. The corner-stone of the present edifice was laid April 28th, 1849.

The Tennessee Historical Society was re-organized in May, 1849. Prof. N. Cross, President, and Col. A. W. Putnam, Vice President.

The Hon. James K. Polk, tenth President of the United States, died at his residence in this city on the 15th of June, 1849, and was placed in a vault at the Cemetery with Masonic honors. The cholera prevailed here at the time, but nevertheless a very large assemblage attended to pay a tribute of respect to their distinguished deceased fellow-citizen. On the 22d of May, 1850, his remains were deposited in the elegant mausoleum prepared for the purpose, on his own grounds, on the eastern front of Polk Place, with solemn and impressive ceremonies. The Masonic fraternity, Governor and staff, Mayor and City Council, Fire Department, Judges of Courts and members of the bar, and an immense number of citizens, attended in procession. Minute guns were fired, and at the tomb the Rev. John B. McFerrin offered an impressive prayer, an original dirge was sung, an appropriate discourse delivered by Rt. Rev. Bishop Otey, and the Masonic funeral rites performed, conducted by Charles A. Fuller. Every demonstration possible was made to testify to the public grief.

The Nashville Gas Light Company was chartered November 14th, 1849, and the city was lighted by gas on the night of February 13th, 1851. The city has now over 600 lamps to light the streets.

The steamer "James Dick" was burned May 7th, 1850.

May 22d, 1850, the first wire was stretched across the river for the present suspension bridge, and on the 28th of June the first

horse and buggy crossed over. The bridge was soon afterward completed.

The Southern Convention met on the 3d of June, 1850, and was in session eight days.

The Adelphi Theater was opened July 1st, 1850, under the management of John Green.

On the 15th of August, the celebrated geologist and mineralogist, Dr. Gerard Troost, died, universally respected in this country and in Europe for his great attainments in geology. His collection of specimens amounted to over twenty thousand in number, and some years after his death was sold to an institution in Louisville.

The first Hoe power printing press was introduced by B. R. McKennie, publisher of the Nashville Whig, in 1845. The first cylinder Hoe printing press was by the "Christian Advocate" office, in 1850.

Jenny Lind, the Swedish Nightingale, gave two concerts and a matinee, March 31st and April 2d, 1851, under the management of P. T. Barnum. Such a musical treat had never been experienced here, and none since. Immense preparations had been made to pack people into the Adelphi by building new galleries and utilizing space generally. Choice seats were sold at auction, the highest bringing $200. Tickets $6, standing room $3, etc. The house was packed to overflowing, and every one seemed wild with enthusiasm. Her singing was the best ever heard in Nashville.

The first passenger train the N. & C. R. R. was run out as far as Antioch on the 13th April, 1851, and the first through train to Chattanooga on the 18th of January, 1853. The road now runs to Chattanooga, south, and to St. Louis, north-west. A large portion of the track has recently been laid with steel rails.

On April 22d, 1851, the corner-stone of the first public school was laid in South Nashville, with Masonic rites, conducted by the venerable Wilkins Tannehill.

A post office was established in South Nashville April 26th, 1851, W. W. Parks, Postmaster. South Nashville had a separate corporate existence for several years, but finally united with the old city, 16th July, 1854, by a popular vote.

The old bridge fell at 6 o'clock, November 14th, just after the workmen who were tearing it down had left off work.

A coal famine existed from January 1st to the 16th, in 1852.

The fire bell, weighing 2,100 pounds, was hung in the Court House March 16th. On the 28th of July impressive funeral obsequies, in honor of Henry Clay, were held; Col. Ephraim H. Foster was the orator of the day. The demonstration was unusually large, and the ceremonies impressive.

The fight (really a private duel) between John L. Marling, editor of the *Union*, and Gen. Felix K. Zollicoffer, editor of the *Banner*, took place on the 20th of August, 1852. The first named gentleman was seriously wounded, the latter slightly.

The Presidential campaign of 1852 was very spirited, and party excitement ran high. Processions, the marching of military campaign companies, etc., were constantly going on, and a number of street fights occurred. One man was killed. After the election, a large torchlight procession moved through the streets, in honor of the election of Gen. Pierce.

The numbering of the houses was completed Feb. 1, 1853.

March the 24th the city and county subscribed one million dollars to aid four railroads coming into the city. April the 7th, Ole Bull and Adelina Patti gave their first concert here. Nashville had, this year, six daily newspapers. Hon. Morgan W. Brown died March 7th; Judge Alfred Balch on the 22nd of June. July 16th, young Watkins jumped into the river from the suspension bridge, in the presence of a large crowd of sightseers, and was picked up by some fishermen not much injured. W. M. Paulding made a balloon ascension on the 15th of October, and landed four miles from the city. Col. Wm. Walker, of Nashville, was declared President of Lower California on the 16th of October, 1853. His Nicaragua expedition is a matter of history.

Ex-President Fillmore arrived in Nashville, May 4, 1854, and was handsomely entertained. W. S. Whiteman, who had been engaged in the manufacture of paper for several years in Nashville, completed a large new mill October 1, 1854. The steamer "Rock City," built in Nashville, departed for Paducah October 15.

The funeral services of Gen. Robert Armstrong occurred on the 8th of January, 1855. On the 10th of March, an unsuccessful attempt was made to burn the Penitentiary. June the 18th

the South Nashville Furniture Factory was destroyed by fire. October 1st the State Fair was held, and the Mechanics' exhibition of wares, fabrics and handicraft took place at Odd Fellows Hall. Mount Olivet Cemetery was laid off into burying lots in October, 1855.

A large fire occurred on the Public Square March 16th, 1856, by which thirteen houses were destroyed. Another destructive fire took place July 9th, by which eight buildings were burned, including the Masonic Hall. August 15th the Grand Union Association of Steamboat and Ship Engineers met in Nashville. The Hon. John L. Marling, United States Minister at Gautemala, died October 16th.

In May, 1857, the Hon. Randel W. McGavock presented the Historical Society with a life-size portrait of Hon. Felix Grundy, in the presence of a large audience.

April 12th, 1857, the Court House was destroyed by fire May 10th, the American Medical Association met here, being. their tenth annual session. The Siamese Twins were on exhibition October 9th, 1857.

The talented and venerable Wilkins Tannehill died on the 2nd of June, 1858. He was a great Masonic light, and a literary writer of more than ordinary brilliancy.

The corner-stone of the new Masonic Hall was laid October 6th, 1858.

The steamer "Quaker City," was burned at our levee February 17th, 1859. On the 4th of March, the funeral obsequies of Ex-Governor Aaron V. Brown took place. He had been a prominent politician for many years, Postmaster General, Governor, etc.

Gen. Wm. T. Haskell, the finest orator in all this region of country, died March 13, 1859, in Kentucky. Dr. John Shelby died at his residence, in Edgefield, May 17th. By a popular vote the City Council was instructed to levy a tax of $270,000 to aid the Nashville and Northwestern Railroad, June 4th. The first sermon in the new Central Baptist Church, South Nashville, was preached by Rev. Dr. W. H. Bayless, July the 3rd. The Mulberry Street Methodist Church was dedicated July the 22nd. The first passenger train from Nashville to Bowling

Green went through, August 13th. August 24th a meeting was called of the subscribers to the new hotel project, when Maj. R. C. McNairy offered a resolution appointing John Kirkman and Sam. D. Morgan Commissioners to act for the subscribers to the hotel, to be erected by John Overton, Esq., on the corner of Cherry and Spring streets, which was adopted; and the first spade pierced the soil for the present Maxwell House August 17th. The presentation of General Jackson's gold snuff box to General Ward B. Burnett, of New York, took place on the 19th of August. The celebration of the opening of the Winchester & Alabama Railroad to Fayetteville took place the same day. A great "Opposition" meeting was held in Watkins' Grove, August 30th, and ten thousand people were said to be present. The remains of Lieut. Chandler, who died in 1801, were removed, under the auspices of the Historical Society, from the Sulphur Springs bottom to Mount Olivet; an immense procession; Hon. E. H. East orator of the day.

The excavation of the foundation of the Church of the Advent was commenced September the 3rd. The Hon. M. F. Maury delivered his celebrated lecture on the geography of the sea, before the Historical Society, September 8th.

The railroad draw-bridge was completed October 1st, and the first passenger train came through from Louisville October 27th. George T. Poindexter, one of the editors of the *Union and American*, was killed by Allen A. Hall, editor of the *News*, in a street fight. On the 23rd of November, 1859, Major Elbridge G. Eastman, principal editor of the *Union and American*, and the most influential political writer in the State, died suddenly at his residence in this city.

Street sprinklers were introduced March 24th, 1860. Dr. Henry Carow was killed by a young man named Truett, from Sparta, Tenn., who was intoxicated at the time. April 9th, a large fire occurred on Union street, the loss amounting to $30,000. The National Typographical Convention was held in the Capitol, May 7th. A grand parade of firemen occurred on the 17th. St. Cloud Hotel was burned May 21st; loss $10,000. Corner-stone of the Church of the Advent laid May the 21st, by Right Rev. Bishop Otey. It was opened for services on

the 17th of April, 1870. The great National Temperance Association met here on the 22nd of May. On the 24th of July, the Board of Aldermen passed the ordinance to establish a paid steam fire department, which was promptly signed by the Mayor. Capt. John S. Dashiell was the first Chief. November 13th, the Rev. John Todd Edgar, pastor of the First Presbyterian Church, died suddenly, universally beloved. On the 30th of December, a large meeting of citizens was held at the Court House, and great excitement prevailed in consequence of the election of Abraham Lincoln to the Presidency, and the secession of South Carolina. Great excitement prevailed in the early part of 1861 in regard to the secession of South Carolina, Alabama and Georgia, and the election of Jefferson Davis as President of the Confederate States. Military companies were organized for home protection, the courts were suspended, and everything was in confusion, even the United States Post Office being discontinued on the 6th of June. August 13th, W. D. McNish was appointed Postmaster for the Confederate Government.

It is simply impossible, in a brief paper like this, to go into detail in regard to the war, commenced in 1861. The State, as well as the city of Nashville, was decidedly opposed to separating from the other States, as expressed by a popular vote, as well as in other ways, until the firing on Fort Sumpter took place, which forced the people to take the Confederate side. A volume would be necessary to give the history of the struggle in this State, and of legislative action prior thereto. We can give only a few meagre items, simply to preserve dates of important events.

Intelligence of the capture of Fort Donelson reached Nashville on Sunday morning, February 16th, 1862, and produced the utmost consternation. The Legislature was convened, but speedily adjourned to Memphis, whither the public archives and money were also removed. Gen. A. S. Johnson's army, concentrated at Bowling Green, commenced passing through the city and continued until the entire force went through. Gen. Floyd was left to cover the retreat. It was a real panic. On the 18th, at night, the troops destroyed the Suspension Bridge and the Railroad Bridge, against the earnest protest of the leading citizens. On the 23d, the rear guard of the Confederate army left, and Gen. D. C. Buel occupied Edgefield with Federal troops. The next

day Mayor Cheatham, and a committee of citizens, surrendered the city, and the surrender took place on the 25th. Gen. Buel and his army conducted themselves, as did the citizens, with "marked propriety." The newspapers, whose publication had been suspended, resumed operations. Gov. Johnson acted as Military Governor from March 12th, 1861, to the close of the war. He ousted the Mayor and City Council for refusing to take the oath of allegiance to the Government of the United States, and appointed others in their place. A great many citizens, most of them leading men in society, and several of them ministers of the Gospel, were arrested by order of Gov. J. and put into prison. A Union meeting was held in Nashville on the 12th May. On the 24th, several newspaper offices were confiscated and their publication stopped. Gen. Forrest, Gen. Morgan and others, made occasional sorties about the neighborhood, which only frightened the citizens, without doing any particular harm. But the city was sometimes cut off from all communication with the outside world. Gov. Johnson levied specific contributions on the wealthy, to aid the poor in procuring food. It is proper to say that he did not himself even see the money thus collected and disbursed. He entrusted it to others. Gen. Buel and his army had left the city for the Tennessee river, and Gen. Rousseau took command in the latter part of August, but was succeeded by a man named Negley—not the regular officer, Gen. Neglee, but a volunteer General. The battle of Lavergne, fifteen miles from the city, was fought October 7th, a signal little victory for the F-deral troops. Gen. Rosecrans was in command in November, and made his headquarters here till the close of the war. Gen. Grant, as the Commander-in-Chief of the Army of the Cumberberland, made his headquarters here for a considerable length of time. The result of the battle of Nashville, commanded by Maj. Gen. George H. Thomas on one side, and by Gen. Hood on the other, is well known. After the struggle was over, a military force was kept here for several years. The army officers and people got along very harmoniously together, and the removal of the troops was generally regretted.

Oct. 20, 1865, Champ Ferguson was hung, at the Penitentiary, on account of war operations. On the 20th Nov., Wm. Heffran was dragged from his carriage and murdered by some ruffians,

who were subsequently apprehended, tried, convicted and hung. Their execution took place January 26th, 1866.

During the latter months of this year, the city was full of thieves and robbers, and deeds of blood and robbery were frequent. It was unsafe to go out at night, without arms. A committee of safety was appointed, and extra policemen placed on duty, until the turbulent spirits were arrested and imprisoned or driven from our midst.

The system of letter carrying was introduced January 1, 1866. The Stacey House, now the Battle House, was opened the next day. A destructive fire occurred on the Public Square, Jan. 9th, and Chas. H. Moore was burned to death. Dr. David T. McGavock, a life-long citizen here, died January 7th.

Street cars were introduced in March, 1866, the South Nashville line, of which Anson Nelson was President, being the first.

The new Suspension Bridge, destroyed in the early part of the war, was completed June 21st, 1866. The Board of Health was established June 27th. Prof. Hayes made a balloon ascension Sept. 20th. Rev. Dr. Samuel D. Baldwin, author of "Armageddon," died Oct. 9th. A fire occurred Oct. 24th, on Cedar, Cherry and Deaderick streets, by which more than twenty houses were destroyed. Loss $300,000.

On the 8th of March, 1867, the funeral obsequies of Col. DeBow, the founder and editor of DeBow's Review, and of Bishop Joshua Soule, took place. Ex-Mayor Andrew Anderson, died April 15th, aged 72 years. He was for more than twenty years connected with the city government, and was highly esteemed.

On the 14th May, a mutiny occurred in the Penitentiary, and there was an uprising of three hundred convicts. The mutiny was suppressed before any escapes were made. The east wing of the Penitentiary was burned on the 24th June. Loss $50,000.

The large bell (the largest and finest in the city) was placed in the western tower of the First Presbyterian Church on the 10th July. It was a present from Mrs. Adelicia Cheatham, wife of Dr. W. A. Cheatham. July 26th, Wm. N. Bilbo, Esq., a lawyer, an orator, and a writer of considerable note, departed this life. Ex-Gov. Wm. B. Campbell died Aug. 19th, and Judge John S. Brien on the 6th of November. The Alloway residence,

next to the McKendree Church, was destroyed by fire December 22d, 1867.

Nothing worthy of note occurred in 1868. Col. A. W. Putnam died on the 20th of January, 1869. He was the President of the Tennessee Historical Society, the author of the "Life and Times of Gen. James Robertson," and a lineal descendant of Gen. Israel Putnam, of Revolutionary fame. Work on the Tennessee and Pacific Railroad commenced June 17th, 1869. In the summer of this year, the City Government was placed in the hands of a receiver, owing to the bad management of those who acted as mayor, aldermen and councilmen. Hon. John M. Bass was appointed by the Chancery Court receiver, and gave a large bond for the faithful performance of his duties. He discharged the trust committed to him with great fidelity, and to the entire satisfaction of the tax-payers. In the latter part of the year, the people elected men of their choice as mayor and aldermen and councilmen; Mr. Bass made a full report, and turned the affairs of the city over to K. J. Morris, Esq., the new Mayor, and his colleagues of the City Council.

The Hon. John Bell, one of Tennessee's noted politicians, died at Cumberland Furnace, Sept. 10th. His body was brought here, laid in state in the Capitol for one or two days, and buried in Mount Olivet Cemetery. The Maxwell House was opened for guests on the 22d Sept., 1869, by M. Kean & Co.

The Post Office was removed to the corner of Cedar and Cherry streets, January 14th, 1880, its present location. Ex-Mayor John Hugh Smith died July 7th. The College Hill Foundry was burned Sept. 11th. Loss $27,000. The improvements on the Capitol grounds were resumed, after ten years' neglect, Oct. 26th, 1870.

The Nashville Industrial Exposition committees were organized on the 26th February, 1871, the building commenced on the 17th March, and the Exposition was formally opened on the 8th of May.

Dr. Wm. H. Wharton, a physician and minister of the Christian church, died May 8th. Christina Neilson sang in Nashville, May 4th. The General Assembly of the Cumberland Church met in Nashville, May 18th, 1871.

On the 10th April, 1871, our German citizens had a grand jubilee procession in commemoration of peace between France and Germany. The death of Rev. T. V. Moore, D. D., pastor of the First Presbyterian church, occurred August 5th, 1871. Judge W. K. Turner died on the 10th of the same month. On the 19th November, the large and elegant Cotton Factory, in North Nashville, was put in operation, running over 75,000 spindles. Col. Saml. D. Morgan was President of the company, and had superintended the building from the very beginning, looking after the minutest details, as he had previously done in the erection of the Capitol. He was for many years one of our leading wholesale merchants.

January 22d, 1872, a great fire occurred on Market street; loss $200,000. Col. G. C. Torbett died February 14th. Mrs. Francis B. Fogg, one of the best and most benevolent ladies that ever lived here, died on the 14th of March. A destructive fire took place on the corner of Market street and the Public Square. Loss $50,000. The epizootic, or horse disease, made its appearance in November, and nearly all the horses in the city were attacked. The street cars stopped running, and oxen were in demand for hauling goods to different depots.

January 1st, 1873, a fire on the Public Square destroyed property to the amount of $25,000. McCrae, Maury & Co.'s distillery was burned January 28th.

The Industrial Exposition was again opened, May 1st, 1873, and was carried on with remarkable success for one month.

The Tennessee Historical Society was re-organized in May, 1874, and has been in successful operation ever since. Its present officers are: Dr. J. G. M. Ramsey, President; Hon. John M. Lea, Vice-president; Gen. G. P. Thruston, Cor. Sec.; J. S. Carels, Treasurer; Dr. J. B. Lindsley, Librarian; and Anson Nelson, R. S.

The new Cumberland Presbyterian church was completed, April 22d, 1874. The corner-stone of the new Odd Fellows Hall was laid, with imposing ceremonies, on the 30th of June. September 16th, the Fourth Annual Industrial Exposition was opened, with an imposing procession of societies and citizens. November 1st, the wholesale house of T. J. Hopkins & Co. was destroyed by fire.

The funeral procession to do honor to the memory of Andrew Johnson, ex-President of the United States, ex-Governor, etc., in January, 1875, was unusually large. The Hon. Joseph S. Fowler was the orator of the day.

Policeman Frazer was killed April 30th. The celebrated Whittle and Bliss meetings were held in April and May, in the old Exposition buildings, and created a profound impression. Vice-president Henry Wilson visited the city in May. Work on the Custom House was commenced November 17th, and the corner-stone will be laid about the 1st of October, 1877.

Luck's Block, on Church street, was destroyed by fire, January 13th, 1876; loss $20,000. Five buildings were burned on South Market street, January 21st; loss $80,000. Mr. A. H. Hicks, the oldest queensware merchant in the city, and for more than forty years Librarian or Treasurer of the First Baptist church Sunday-school, died March 5th. The heaviest snow storm that had been known here for thirty years, occurred on the 19th March. A convention of colored people, to benefit the race, was held in the Capitol, April 5th. On the 26th May, the Jewish temple, on South Vine street, was dedicated. A grand Tobacco Fair was opened on the 13th June.

The Centennial was celebrated with great eclat, by ringing of bells and other demonstrations of joy. All business was suspended. The post band was at the Capitol before 5 o'clock, where 5,000 people were assembled. The exercises of the Historical Society of Tennessee were exceedingly interesting. Prof. Thos. H. Huxley, the great English scientist, was here in the early part of September, visiting relatives. Isaac Paul, Esq., one of our oldest and most benevolent citizens, died October 21st, aged 72 years. The first grain elevator was finished October 29th, by O. F. Noel & Co. Another was completed and put to work in 1877, with improved machinery, by Holding, Wilkes & Hancock. Seven and a half inches of snow fell during Christmas week, followed by very cold weather.

A balloon ascension, by Prof. Samuel A. King and Dr A. C. Ford, was successfully made on the 3rd of April, 1877. On the 18th June, the mammoth balloon, "Buffalo," the largest in the United States, went up with Prof. King, Dr. Ford, J. B. Lillard, D. R. Dorris and J. M. Andrews in the basket. They landed

in Gallatin, and the next morning Prof. King and Dr. Ford ascended again and were above the earth nearly all day, landing in Wilson county. They returned to Nashville next day. On the 7th of May, the corner stone of the new McKendree church, now in process of erection, was laid by the Bishops of the M. E. Church, South, with appropriate ceremonies, in the presence of a large assemblage of interested spectators. On the 26th of June, the Merchants' Exchange was re-organized and opened for business.

On the 29th August, the twenty-sixth annual meeting of the American Association for the Advancement of Science, opened its sessions in the Capitol. The history of their acts and doings, the cordiality of their reception, the dinings and the excursions, are too fresh and familiar to require notice; besides, want of space prevents any proper reference to this meeting of the scientific and educational lights of the country. It would require several pages to do justice to the subject.

The annual meeting of the Chiefs of the Fire Department of different cities of the United States, will assemble on the 4th of September. They, also, will be elegantly entertained, and our people will make it a visit to be remembered. Our own department has four steam fire engines, as many hose carts, one hook and ladder truck, with horses and all necessary appliances, including 7,000 feet of hose. Capt. Wm. Stockell is Chief, and has been since the summer of 1869. Forty men are constantly on duty, to manage the four fire companies in different parts of the city, and the hook and ladder company. Hall's telegraph alarm has twenty miles of wire on poles, divided into four districts, united by an automatic repeater. Connected with the wire are forty alarm boxes, nine gongs and three large bell strikers. The Fire Alarm Telegraph went into operation on the 30th of January, 1875; cost $22,500. The cost of the department is about $35,000 perannum.

The city government consists of a Mayor, ten Aldermen, twenty Councilmen, and the necessary public officers to carry on the business of the municipality, including 39 policemen. The city is composed of ten wards. There are two telegraph companies, two daily newspapers, two tri-weeklies, eight weeklies, seven monthlies, and two quarterlies.

Nashville and Edgefield has at this time forty-four churches, as follows: Methodist—white 10, colored 3; Baptist—white 5, colored 3 (one of which has 1,600 members); Presbyterian—white 5; Episcopal—white 6; Christian—white 3, colored 1; Cumberland Presbyterian—white 2; Hebrew—white 1; Lutheran—white 1; Congregational—colored 1; Catholic—white 3.

The first experiment with a telephone in Nashville was made at noon on the 1st of September, by Prof. Nipher, of St. Louis, and Prof. Lovewell, of Wisconsin. The experiment was made by connecting the residences of Mrs. Ex-President Polk and Mr. A. G. Adams, on Vine street, the battery being at the house of the latter. It was entirely successful. The Professors were in attendance on the A. A. A. S.

The new Merchants' Exchange, J. P. McGuire, President, is to be opened with appropriate ceremonies on the 6th of September. President R. B. Hayes, with two or three members of the Cabinet, are expected in Nashville on the 19th.

EDUCATIONAL ITEMS.

The *University of Nashville* was founded by the State of North Carolina, December 29, 1785, as Davidson Academy. Its name was changed to Cumberland College in 1806, but was incorporated as the University of Nashville in 1826. It is an eleemosynary, self-perpetuating corporation, and is under the control of neither Church nor State. In 1855, Montgomery Bell bequeathed to the institution a fund of $20,000. This now amounts to nearly $50,000, and endows a grammar school. In 1850, the Medical College was organized, and the attendance averages 175 to 200 students. It is supported by fees alone. In 1875, the collegiate department was suspended, and its grounds, buildings and funds appropriated to a Normal College, sustained mainly by the Peabody education fund. Tuition is free to young women and young men alike. Twenty-three acres of land, and four large buildings, constitute the property of the University, and are valued at $150,000. The Normal School is the only first-class school of its description in a region of 800,000 square miles.

The heads of the University have been as follows: James Priestley, LL. D., President, 1809-15; and again 1819-20; Philip Lindsley, D.D., President, 1824-50; John Berrien Linds-

ley, M. D., LL. D., Chancellor, 1855-70; Gen. E. Kirby Smith, 1870-75; E. S. Stearns, D. D., appointed in 1875, and now in service.

The Public Schools of Nashville.—In 1850-51, a few citizens agitated the question of establishing a system of genteel and elevated free schools, which finally aroused the Board of Aldermen, who, in the spring of 1852, selected Alfred Hume, long an eminent private teacher in Nashville, to visit various cities in which public schools were in operation, to see how they worked. He did so, and made a report to the Aldermen and the public on the 26th of August. The city then bought the lot on the corner of Spruce and Broad streets, to erect a building. The corner-stone was laid on the 19th of May, 1853, Dr. W. K. Bowling being the orator of the day. The house then and now known as the Hume building, was completed in 1854, and formally opened for pupils on the 26th February, 1855. M. H. Howard, Esq., long a resident here, but now living in the city of New York, gave the lot on which the Hynes' building now stands, in 1859. The lot on which the Howard building now stands was purchased with the proceeds of the sale of lots donated to the city by Col. Andrew Hynes. The Hon. John Trimble donated the lot on which is erected the Trimble School building. The city now has seven school houses, with an average attendance of nearly three thousand. Joshua F. Pearl was the first Superintendent; S. Y. Caldwell is the present Superintendent. Both were very happy selections. There are not over 500 scholars in Nashville that attend other than the public schools—so well conducted and popular are they in every characteristic that makes up a good school. They are maintained by taxation, at a cost of $55,000 to 60,000 per annum. Value of school property belonging to the city, $150,000.

Vanderbilt University.—This magnificent institution, located in the western suburbs of the city, owes its foundation to the munificence of Cornelius Vanderbilt, of New York, who, on the 27th March, 1873, made a denation of $500,000, to which he afterwards added about $200,000. Earth was broken for the main edifice September 15th, 1873, and the corner-stone was laid April 28th, 1874. The University opened October 3-4, 1875, on which days suitable dedicatory and inaugurative services

were held. The sermons, addresses and proceedings were published in a volume at the time. The cabinet of minerals and rocks comprise about six thousand specimens. The apparatus for astronomical observations, for the school of physics, the chemical laboratory, etc., are not surpassed in this country. Professors N. T. Lupton, J. M. Safford, Alexander Winchell, W. L. Broun, L. C. Garland, J. C. Granbery, M. W. Humphreys, W. Arnold, E. S. Joynes, A. A. Lipscomb and J. M. Leech, occupy chairs in the departments of Philosophy, Science and Literature. A competent corps of teachers are in the Biblical, Law and Medical departments.

Ward's Seminary.—The seminary for young ladies, under the control and management of Rev. W. E. Ward, occupies a fine, spacious building on Spruce street. It was chartered in 1867. The attendance is about three hundred pupils. Grounds and buildings cost about $50,000. It is patronized by young ladies from almost every State in the South.

Dr. Blackie's School.—The school for young ladies, conducted by Dr. George S. Blackie, on South Cherry street, is a new institution, comparatively, but well patronised.

St. Cecilia's Academy.—This institution, under the management of the Sisters of the Order of St. Dominic, (Catholic), is situated on an elevated and lovely eminence north of the city, overlooking the valley of the Cumberland river. It was founded in 1860, and is well sustained.

St. Bernard's Academy.—This is a Catholic institution, located immediately south of the Capitol, and is conducted by the Sisters of Mercy, who own the fine property occupied by the school.

A school for boys, on Vine street, known as St. Mary's school, is also a Catholic institution, well conducted and liberally patronized.

Fisk University was established by the American Association in 1866. It was known as the Fisk School till 1867, when it was incorporated as a university. It makes no distinction of race or sex, but the institution was especially designed for colored youth, and the students are composed almost entirely of colored persons. In 1871, a number of the students were organized as a singing band, known as the "Jubilee Singers," who, by concerts in the Northern States and in England, made clear of expenses,

$130,000, which was devoted to the purchase of a permanent site for the University, comprising twenty-five acres, in a beautiful suburb of the city, and to the erection of a fine building called Jubilee Hall. The singers are now engaged in their work in Europe, raising an endowment of $100,000 for the institution. The number of instructors is fourteen; the property of the institution is valued at $200,000. The school has been remarkably successful. Prof. John Ogden was Principal of the University from 1866 to 1870; Prof. A. K. Spence 1870-75, when Rev. E. M. Cravath was elected President, and is now in service.

The Central Tennesse College, located in the southern part of the city, was organized in 1866, under the patronage of the Methodist Episcopal Church, and is supported almost entirely by the Freedman's Aid Society of that church. The buildings, valued at $45,000, are large and imposing. The school has been very successful, and has an average attendance of over two hundred. The Rev. John Braden, D. D., is the President.

The Nashville Normal and Theological Institute, for colored pupils of both sexes, was opened by the American Baptist Home Mission Society in 1866. The Rev. D. W. Phillips, D. D., was then, as now, the Principal of the Institution. From an humble beginning, in obscure quarters in the northern suburbs of the city, it has grown to almost gigantic proportions, and now occupies one of the largest and most elegant houses in the southwestern suburbs, situated on a lovely and beautiful site. The grounds alone cost $30,000. It is in sight of, and not far from, Vanderbilt University. It is well patronized.

There are several schools for very young children, where the little ones are prepared for the public schools, which we have not time to notice.

From all of which it will be seen that Nashville is indeed a great educational center.

CONCLUSION.

We regret very much that we cannot refer to our numerous manufacturing establishments, our magnificent wholesale and retail store-houses, our numerous charitable secret associations, our banks, insurance offices, railroads, our Tennessee Historical Society, our medical schools, our private libraries, our orphan asylums, our noble institutions for the Insane, for the Blind, etc.

One word we must say in regard to the School for the Blind, sustained by State aid. They have, ever since the war, very much needed a suitable building for their poor unfortunate inmates. The appropriations by the Legislature being too small, one of our most enlightened and liberal citizens (the Hon. John M. Lea) came to the rescue, and bought and gave the State an elegant house, with fine grounds attached, at an expense of $15,000, the buildings on which have been enlarged by the State. This timely benefaction has been an incalculable blessing to the blind throughout Tennessee. J. M. Sturtevant is the Principal of the school for the blind.

It will be seen that many matters of small importance have been mentioned in the sketch, even to the exclusion of matters of perhaps rare interest. This is done for the reason that it is important to save the minor items from oblivion, while more important things will surelp be perpetuated. The object has been to point an index finger for others to write a better sketch in future.

ANALYTICAL INDEX.

BY

GEORGE S. BLACKIE, M. D., PH. D.,

Professor of Chemistry in Nashville Medical College.

ANALYTICAL INDEX.

A

Abattoirs, about to be fitted up in Milwaukee..... 67
established in Boston..... 66
" Jersey City..... 66
" New Orleans..... 66
" New York..... 67
" Philadelphia..... 67
Kearney on the advantages of..... 68
propriety of establishing in Nashville 65
urged in Cleveland..... 66
" District of Columbia..... 66
" St. Louis..... 67
Abolition of pits and boxes..... 34
Acids and bases, combination of in Judge's Spring water..... 162
combination of in Reservoir water....162
" Wilson's Spring " 162
Adams, Dr. J. F. A., on contamination of well water in Massachusetts..... 45
African mortality in Baltimore..... 25
in Charleston..... 25
in Chattanooga..... 24
in District of Columbia..... 24
in Knoxville..... 24
in Memphis..... 24
in Mobile..... 25
in Nashville..... 23
in New Orleans..... 25
in Richmond..... 24
in Selma..... 25
African population of Nashville..... 23
Ages of persons dying in Nashville in 1875..... 116
in 1876..... 125
Air, fresh, in disease..... 76
supply..... 54
Albany, N. Y., water, analysis of.....163
Alexandria, Va., adoption of odorless machines in..... 37
Alleys of Nashville, bad condition of..... 49
American Association for Advancement of Science, meeting in Nashville....211
American Medical Association, meeting of in Nashville.....203
"American" office, files of the.....185
Analysis of Albany water.....163
Cochituate water.....163
Croton water.....163
Judge's Spring water.....161, 162, 163, 165
Kent Company Water.....165
Lake Michigan water.....163
London Water Supply water.....165
Reservoir water.....161, 162, 163, 165
Schuylkill water.....163
Seine water.....163
Syracuse water.....163
Thames water.....163, 165
water, a complete.....164
" comparison of cities.....163
" Wanklyn & Chapman on.....166
Wilson's Spring water...161, 162, 163, 165
Anderson, Andrew, death of.....207
Animalcules in Nashville water.....169
Annals of Nashville, Brief, by Anson Nelson.....183
Armstrong, Gen. Robert, funeral of.....202
Assistance, timely, rendered to Board of Health by Nashville physicians..... 81
Atchison, Dr. T. A., appointed on Board on Board of Health for 10th ward... 12
appointed on Sanitary Commission... 94
Atlanta, Ga., creation of Sanitary Commission in..... 36
report on night-soil question..... 37
Sanitary Commission of..... 36
Atmospheric tides.....178
Attention to the sick poor..... 76
Avenues of trees, Everett on..... 56
Avoidable losses—counting the cost..... 89

B

Bad drainage, Williams on..... 30
Bailey, Thomas, account of Nashville....188
Baker, Henry B., on scarlet fever..... 73
Balch, Judge Alfred, death of.....202
Balloon ascensions in Nashville..202, 207, 210
Baltimore, Md., adoption of odorless machines in.....35, 37
death rate of..... 25
report on odorless machines.....35, 36
Stewart on condition of well water in, 43
Baldwin, Dr. S. D., death of.....207
Bank of Tennessee chartered.....191
Banks chartered in Tennessee.....193
Barnard, Henry, views of, in American Journal of Education..... 68
Barrett, Dr. W. L., on sewerage and drainage..... 53
urges the establishment of abbattoirs in St. Louis..... 67
Bass, John M., appointed Chancery Court Receiver.....207
Bath-tubs in Nashville.....110
Baxter, Dr. M., Physician of University Hospital..... 71
Beauchamp, Dr. J. A., appointed on Board of Health for Eighth ward... 12
Bed of common limestone.....150
Bell, A. N., "The Sanitarian"..... 51
Bell, John, death of.....208
Belt of calms.....174
Bilbo, W. N., death of.....207
Births, registration of..... 20
Blackie, Dr. Geo. S., school of.....214
Bliss, Dr. D. W., on death rate of District of Columbia..... 24
Board of Health of Charleston, Simons on 15
Mobile organized..... 61
Nashville, attempt to revive in 1869... 13
" bill for, amended, 1867..... 12
" divided into commit's 1866 12
" established by city gov't... 12
" new ordinance for in 1874.. 14
" ordinance establishing..... 16
" organization in 1866..... 11
" " 1874..... 14
" report of Dr. Lindsley to.. 9
" resolutions on registration of ozone.....180
" territory embraced in jurisdiction of.....144
" thanks of, to medical men of Nashville..... 71

Board of Health of Nashville, virtually comes to an end in 1868 ... 13
New York on dumping ashes, etc ... 41
St. Louis, established ... 16
Boards of Health as public instructors, Hall on ... 85
duties to the public ... 75
extension of limits of jurisdiction of by act ... 64
objects of ... 15
should co-operate with physicians in charge of poor ... 75
Boards of Inspection ... 65
Boardman, Dr. W. E., on error in regard to increase of population causing increase of death rate ... 28
warning to Massachusetts ... 27
Boston, Mass., abattoir established in ... 66
adoption of odorless machines in ... 37
advance in death rate of ... 26
example of ... 97
Report, 1876, extract from ... 19
water, report of Prof. Nichols on ... 168
Bowditch, Dr. H. J., on dampness and consumption ... 51
Bowling, W. K., on sanitary reform hampered by outside population ... 98
plan for improvement of Nashville lowlands ... 40
speech on public schools ... 213
Braden, John, President of Central Tennessee College ... 215
Breezes, local at Nashville ... 175
Brennan, T. L., secretary of Robertson Association ... 93
Brien, Judge J. S., death of ... 207
Briggs, Dr. C. S., assists Health Officer ... 81
Briggs, Dr. W. T., " " " ... 81
British Commission on hard water ... 159
on well water ... 158
on zymotic diseases propagated by water ... 160
British legislation on sanitary science ... 29
Brock, Dr. Hugh W., on hygiene of school room and its surroundings ... 69
Brodie, Dr. C. A., appointed on Board of Health for Eighth ward ... 12
Brooklyn, adoption of odorless machines in ... 37
Brown, Aaron V., death of ... 203
Brown, Morgan W., death of ... 202
Brown's Creek ... 136
Buchanan, Dr., on dampness and consumption ... 51
Buchanan, Dr. T. B., appointed on Bo'd of Health for Sixth ward ... 12
Bucket system, Cleveland Report on defects of ... 36
Buist, Dr. J. R., appointed on Board of Health for First ward ... 11
elected Secretary of Board of Health 14
re-elected " " " 15
resigns secretaryship " " 14
Burials in City Cemetery, record of ... 60
Burr, Aaron, visits Nashville ... 189

C

Cabell, Dr J. G., on inspection of Richmond ... 63
Report on Hygiene and Public Health 87
urges tree planting ... 58
Caldwell, S. Y., Sup't of Public Schools ... 213
Callender, Dr. J. H., appointed on Bo'd of Health for Fifth ward ... 12
meteorological observations of ... 175
Campbell, Dr. H. F., on registration in Massachusetts ... 18
Campbell, General W. B., death of ... 207
Capitol, description of ... 198
foundation laid ... 198
Capitol grounds ... 56
Hill ... 136
" purchased by State ... 196
limestone ... 151
" fossils of ... 151
Care of prisoners ... 82
Carels, Jos. S., Treasurer of Tennessee Historical Society ... 209
Carow, Dr. H., death of ... 204
Carroll, Governor W., death of ... 197
Carter's Creek limestone ... 151
Causes of death in Nashville in 1875 ... 111, 112, 113, 114
in 1876 ... 120, 121, 122, 123
Census of Nashville, 1877, colored ... 106
whites ... 105
population by wards ... 107
Central Basin ... 147
Central Tennessee College ... 215
Chandler, Dr. C. F., on well water in New York ... 43
Chapman & Wanklyn on water analysis ... 166
Charleston, S. C., adoption of odorless machines in ... 37
city physicians of ... 81
death rate in ... 25
fills in, increasing death rate ... 40
hospitals created in by private charity 79
Simons' observations on ... 87
" on Board of Health in ... 15
Chattanooga, Mortuary Report of ... 24
Cheatham, Dr. W. A., appointed on Bo'd of Health for First ward ... 11
Chemical determination of organic matters in water ... 164
Chiefs of fire departments meet in Nashville ... 211
Chlorine in water ... 166
receipt for generating ... 74
Cholera and measles in hogs ... 65
Cholera and wells ... 46
Cholera, Asiatic, close of epidemic in 1866 52
epidemic in 1866 ... 12
first case in 1866 ... 12
has no business in Nashville ... 93
in Nashville in 1833 ... 46
" in 1849-50 ... 46
" in 1866 ... 11, 47
" " estimate of deaths from ... 12
in Nashville in 1873 ... 43, 47, 93
" " cost of ... 93
" most prevalent on the outskirts ... 47
not a mysterious disease ... 93
origin of ... 31
propagation of ... 31
researches into ravages of in Great Britain ... 29
Cholera in chickens ... 65
Christ Church built ... 192
Churches in Nashville ... 212
Cicero, Marcus Tullius, on the health giver ... 29
on tree planting ... 57
Cincinnati Epoch ... 148
Cincinnati, O., city physicians of ... 82
report on vigilance in disbursing system ... 78
report, views on abattoirs ... 68
Cities of U. S., death rates in ... 129, 130
other, death rate ... 131
City Cemetery of Nashville ... 59
continued by long suffering good nature ... 59
opened ... 191
record of burials in ... 60
should be closed ... 59
should be made a monumental park ... 59
City Government of Nashville amends Board of Health bill 1861 ... 12

City Governm't of Nashville establishes Board of Health 12
illegal step in the case of Dr. Jones... 13
City Park of Nashville, purchase of 59
City patients in Univ. Hospital for 1876..103
City physicians of Charleston 82
of Cincinnati 82
of Nashville, importance of appointing 81
Claiborne, Thomas W., public-spirited citizen 95
Clark, Dr., plan for softening hard water 164
Cleanliness enjoined in scarlet fever..... 74
McClellan on 30
of Cleveland 28
of Louisville 29
of Philadelphia 28
of St. Louis 29
Dr. Wesley on 47
Clergy, work of the, in public enlightenment 86
Cleveland, O., adoption of odorless machines in 36
and Nashville compared 32
area of 97
city physicians of 82
cleanliness of 28
contamination of well water in 44
diphtheria in 31
Kelley urges an abattoir in 66
report on defects of bucket system.... 36
report on odorless machines 36
Climate and travellers 181
of Nashville, excellence of 173
" Ford on 171
Cochituate water, analysis of 163
Cochrane, Dr. Jerome, appointed Health Officer of Mobile 61
on yellow fever in Memphis 92
rigid inspection by 61
Cold extreme of 1877 176
Coleman, Jos., first Mayor of Nashville..190
College Hill limestone 149
Commerce of Nashville 95
Compton, Dr. H. M., appointed on Bo'd of Health for Second ward 11
death of 15
Conclusion 215
Consumpt'n and dampness, Bowditch on 51
Buchanan on 51
Conwell, Dr. J. P., appointed on Sanitary Committee 94
Coroner's office, imperfections of Tennessee Code in respect to 21
suggestions in regard to improvement of 21
Cox, Dr. C. C., urges establishment of abattoir in District of Columbia..... 66
Cravatte, E. N., President of Fisk University 215
Croton water, analysis of 163
Crutcher, Thomas, death of 196
Cumberland Church, General Assembly meets in Nashville 208
Cumberland River, course of 135
gauge of 178
influence of on Nashville climate 177
overflows of 177
water 41
" favorably compares with other..163
Cyrtodonta bed 150
fossils of 150

D

Damp cellars, Winsor on 52
Dampness a cause of disease 47
and consumption, Bowditch on 51
" Buchanan on 51
caused by carelessness in alleys 49
" defective gutters 49
Dampness caused by faulty position of down spouts 49
disease and drainage 51
prevention of 47, 50
remedies for 49
undue causes of in Nashville 48
Davidson county, inquests in, 1876 21
Death of Andrew Anderson 207
Judge Alfred Balch 202
Dr. S. D. Baldwin 207
Hon. John Bell 208
Hon. W. N. Bilbo 207
Judge J. S. Brien 207
Hon. A. V. Brown 203
Hon. Morgan W. Brown 202
Gov. W. B. Campbell 207
Dr. H. Carowe 204
Thomas Crutcher 196
Col. J. B. Debow 207
Rev. J. T. Edgar 205
E. G. Eastman 206
Champ Ferguson 206
Thos. H. Fletcher 197
Mrs. F. B. Fogg 209
Robert Gilkie 187
Hon. Felix Grundy 195
General Harrison 195
Gen. W. T. Haskell 203
A. H. Hicks 210
President Andrew Johnson 210
J. L. Marling 203
Dr. D. T. McGavock 207
W. McNeill 196
Dr. T. V. Moore 209
Joseph Norvell 199
Isaac Paul 210
G. T. Poindexter 204
Col. A. W. Putnam 208
Dr. John Shelby 203
Hon. John Hugh Smith 208
John Somerville 199
Bishop Soule 207
Wilkins Tannehill 203
Robert Weakley 197
Dr. W. H. Wharton 208
Deaths, causes of, in Nashville in 1875... ..... 111, 112, 113, 114
in 1876 ..... 120, 121, 122, 123
Death rate, advance of, in Boston 26
amelioration of, in German cities 28
" in Glasgow 28
" in Paris 28
and increase of population, error in regard to 28
diminution of 29
ignorance in regard to use of term.... 27
increased by fills 40
normal or lowest 89
of Baltimore 25
of Charleston 25
of Chattanooga 24
of District of Columbia 24
of foreign cities, 1876 131
of Knoxville 24
of Liverpool 28
of Memphis 24
of Mobile 25
of Nashville 22
" causes of relatively high 22
" increased by want of medical attendance.... 80
" should not be above that of Cleveland 89
of New Orleans 25
of Richmond 24
of Selma 25
warns, the 26
of cities of U. S. in 1876 ..... 129, 130
Debow, Col. J. B., death of 207
Deleterious effects of impurities in water 158
De Mon Breun, early settler 186

Derby, Dr. Geo., extract from Massachusetts Report of 51
on advance of death rate in Boston... 26
on contamination of well water..... 45
on diminution of death rate in Great Britain..... 27
on human excreta causing disease..... 33
Detroit, Mich., adoption of odorless machines in..... 37
drainage and health in 52
Diminution of death rate 29
in Great Britain 27
Diphtheria in Cleveland..... 31
in Nashville 31
Disease and Filth..... 29
Williams on..... 30
Disease caused by human excreta..... 33
dampness a cause of..... 47
direct prevention of 70
Diseases produced by dampness..... 48
District of Columbia, Cox urges establishment of abattoirs in..... 66
death rate of 24
physicians 80
need of organization of corps of... 80
Dispensary..... 76
of Nashville 76
system, Cincinnati report on vigilance in 78
Donelson, John, pioneer.....98, 187
Dove limestone.....150
fossils of.....150
Down spouts, faulty position of causing dampness 49
Drainage..... 50
and health, Lyster on 52
in Nashville.....110
of Nashville, facilities for.....139
Drains and sewers, difference of..... 39
Drake, Daniel, on trees and malaria 58
Draughon, Dr. J. A., elected on Board of Health 15
Drinking water, importance of the subject 45
Lupton on 155
DuPre, Dr. D., appointed on Board of Health for Tenth Ward..... 12

E

Early settlers in Middle Tenn., health of 47
Earth closets..... 33
East, Dr. A. A., Physician of University Hospital..... 78
Eastman, Maj. E. G., death of.....204
Edgar, Dr. J. T., death of.....205
Installed pastor.....193
Edgefield and other districts should combine with Nashville..... 98
Education, Barnard's Journal of..... 68
New England Journal, Views of..... 68
physical necessity of..... 69
three essential elements of..... 68
Educational items.....212
Effects of human excreta in causing disease 33
Elements, essential, of education..... 68
Eliot, Dr. W. G., on the St. Louis work house..... 83
Elliott, Dr. C. D.....190
England, Folsom on register of deaths in. 18
Epidemics, prospects of cessation of..... 91
Rush on..... 91
Epizootic in Nashville.....207
Esplanade in Nashville, suggestion for... 56
Estimate of losses caused by yellow fever in Savannah..... 92
Eve, Dr. Duncan, assists Health Officer.. 81
Eve, Dr. Paul F., assists Health Officer.. 81
Everett, Edward, on avenues of trees..... 56
Ewing, Dr. W. G., assists Health Officer.. 81
Excreta, Goldsmith on disposal of..... 37

F

Farion, Dr., on fish-like odor of water...168
Fenner, Dr. E. D., sanitary measures of in New Orleans 93
Ferguson, Champ, death of 206
Fills, best materials for making..... 40
facilities for making..... 40
filth not fit for..... 40
in Boston, increasing death rate..... 40
in Charleston, increasing death rate.. 40
Filter box.....143
Filtering gallery at Lowell..... 167
Filth and disease..... 29
" Wells on..... 31
" Williams on..... 30
human excreta, removal of..... 32
increases danger of scarlet fever..... 73
kitchen garbage and slops, removal of. 38
not fit for fills..... 39
removal of..... 29
Filtration of Nashville water, natural.....142
purification of water by.....161
remedy for fish-like odor of water.....170
Final suggestions..... 89
Financial crisis in Nashville.....194
Fire alarm telegraph established in Nashville.....211
Fire department of Nashville.....211
Fires in Nashville, 194, 200, 203, 207, 209, 210
Fisk University.....214
Fish-like odor of potable waters.....168
reservoir water..... 169
Rochester water 168
Farion on.....168
filtration a remedy for..... .170
Lattimore on..... 168
Flat lands of Nashville.....148
Fletcher, Thomas H., death of.....197
Fogg, Mrs. F. B., death of.....209
Folsom, C. F., on registration of deaths.. 18
on registration of deaths in Massachusetts..... 17
Ford, Dr. A. C., Meteorological record of Nashville for 1875..... 119
for 1876..... 128
on the climate of Nashville.....171
Foreign cities, death rates in, 1876.....131
Fort Casino.....136
Gillem 137
Houston.....138
Morton.....136
Negley 136
Fossils of Capitol limestone.....151
College Hill limestone.....150
Cyrtodonta bed.....150
Dove limestone 150
Orthis bed.....151
Foul air from pits..... 33
Frankland's method of determining organic matter in water 164
Franklin, Benjamin, axiom on health..... 90
on well water in cities..... 42
State of, short existence of.....188
Future of Nashville..... 94

G

Garland, L. C., Professor in Vanderbilt University 214
Geology and Topography of Nashville, Safford on..... 145
Geology of Tennessee explains poisoning of wells 47
Georgetown, D. C., adoption of odorless machines in..... 37
Georgia State Board, report of..... 70
Germ Theory..... 46
discussion of..... 31

German cities, amelioration of death rate in..... 82
Gilkie, R., death of.....187
Glasgow, amelioration of death rate in... 28
Glenn, Dr. W. F., assists Health Officer. 81
Goldsmith, Dr. W. T., on disposal of excreta..... 37
Grand Rapids, Mich., adoption of odorless machines in..... 37
Gray, Dr. Crosby, report on inspection of Pittsburg..... 61
Great Britain, diminution of death rate in..... 27
Health Officer of losing his place on account of hogs..... 89
researches into ravages of cholera in.. 29
Royal Commission on drinking water.155
Gross, Dr. S. D., on regulation of Syphilis..... 72
Grundy, Hon. Felix, death of.....195
Guage of Cumberland River.....178
Gutters, defective condition of a cause of dampness..... 49
necessity of a law on the obstruction of 49

H

Haggard, Dr. W. D., assists Health Officer 81
Hall, Dr. Elisha, on functions of Boards of Health as public instructors..... 85
Hamilton, Prof. James, a devotee of science.....177
Hardness of water.....163
removed by boiling.....163
Hard water, British Commission on.....159
Clark's plan for softening.....164
Lethby on wholesomeness of 164
Harrison, Gen., death of.....165
Haskell, Gen. W. T., death of.....203
Hawkins, Sergeant B. M., detailed as Sanitary Inspector of Nashville..... 64
Health Officer, duties of..... 12
method of election of..... 13
Dr. Jos. Jones elected as..... 13
Dr. J. B. Lindsley elected as 15
Dr. J. W. Morton elected as..... 15
salary of..... 12
Heat as a disinfectant..... 74
Heat of Nashville, Dr. J. M. Safford on..169
Hicks, A. H., death of.....210
E. D., meteorological observations of.175
observations on rainfall 179
Highest temperature at Nashville.....176
Highlands, river of.....147
Hillhouse, New England's benefactor as a tree planter..... 56
Hindoos, filthy habits of..... 31
Historical introduction..... 11
Hog question, wise decision of people on. 89
Holland, Dr. Henry, on animalculæ and disease..... 40
Horton, Dr. W. D., appointed on Board of Health for Ninth Ward..... 12
Hospital..... 78
Householders, duties of to the public..... 75
Houses, character of in Nashville.....108
Howell, M. B., elected member of Board.. 14
Hudson River Epoch.....148
Hughes, Dr. T. M., appointed on Board of Health for Ninth Ward..... 12
Human excreta, effects of in increasing disease..... 33
removal of..... 32
Hume, Alfred, report on public schools.213
Huxley, Prof. T. H., on importance of studying elementary physiology in schools..... 70
visit to Nashville in 1876.....210
Hydrants, waste water from..... 48
Hygiene and State Medicine, Cahill on... 87
Simons on..... 87
Hygiene, Levy on..... 11
of school room and surroundings, Brock on..... 69
of schools, Nottingham on 70
Quintard on..... 11
State Medical Society of Alabama on 87
" " " Tennessee on.. 87

I

Importance of inspection of food..... 65
Importance of water supply.....155
Impurities in water, deleterious effects of.158
Increase of population and death rate, error in regard to..... 28
Indian graves.....186
occupation of Nashville.....186
Indians, Suwanee.....186
Inland cities, Stephens on growth of 97
Inorganic impurities in water.....158
Inquests in Davidson county in 1876..... 21
Inspection of food..... 65
of meat..... 65
of Nashville 64
" labors of the work 64
" results of the work..... 65
of New Haven, Ct., Lindsley on the.. 62
of Philadelphia, report on 63
of Pittsburg..... 61
of Richmond, Cahill on..... 63
of schools 68
of Selma, Reese on 63
system of Gray in Pittsburg..... 61
" Cochrane in Mobile..... 61
Inspections cannot be too frequent 63
Inspectors, duties of in Pittsburg 61
Intellectual influence of Nashville..... 95
progress of Nashville, McEwen on..... 96

J

Jackson, Andrew, Attorney General.....188
death of.....198
Jenner's discovery in small-pox..... 71
Jerome, St., first hospital established by.. 76
Jersey City, N. J., abattoir established in 66
adoption of odorless machines in..... 37
Johnson, Andrew, death of.....210
Jones, Dr. Heber, on odorless machines.. 36
Dr. Joseph, election as Health Officer 13
Joynes, E. T., Prof. in Vanderbilt University 214
Judge's Spring water, analysis of, 161, 162, 163, 165.
variations in.....166

K

Kearney, Dr. T. H., on the advantages of abattoirs..... 68
Kelley, Dr. E. H., urges an abattoir in Cleveland..... 66
Kent company water, analysis of.....165
Kercheval, Thos. A., appoints Sanitary Commission in Nashville..... 94
member of Board of Health..... 14
Kerrigan, Martin, detailed as Sanitary Inspector of Nashville..... 64
Kirkpatrick Hill.....136
Kitchen garbage, careless disposal of a cause of disease..... 38
an evil 38
removal of..... 38
Knoxville, Tenn., death rate of..... 24

L

Lafayette, General, visits Nashville. 191
Lake Michigan water, analysis of.....163
Lambuth, Dr. W. R., assists Health Officer 81

Lattimore, Dr. on fish-like odor of water.168
Lea, John M., generosity of 216
Vice President of Tennessee Historical Society.....209
Lebanon, Tenn., meteorological observations at.....176
Lebby, Dr., on death rate in Charleston.. 25
Lee, D. Benj., on cost of small-pox epidemics 91
Letheby, Dr., on wholesomeness of hard water.....164
Levy on hygiene, public and private, extract from..... 11
Lick branch 135, 136, 138
Liebermeister on germ theory 31
Liebig, Justus, on germ theory 32
Lillard, J. B., aeronaut.....210
Limit of jurisdiction of Boards of Health extended..... 64
Limestone, bed of common 150
Capitol 151
Carter's Creek 151
Dove 150
section of Nashville beds.....149
Lind, Jenny, visits Nashville.....201
Lindsley, Dr. C. A., on continuous inspection in New Haven..... 62
Lindsley, Dr. J. B., assignment of as Health Officer..... 9
Chancellor University of Nashville...212
elected Health Officer 15
Librarian of Tenn. Hist. Society.....209
report to Board of Health in Nashville..... 9
Lindsley, Dr. Philip, President of University of Nashville.....96, 212
Lindsley, Dr. V. S., appointed on Board of Health for Ninth Ward..... 12
assists Health Officer 81
Liverpool, death rate in..... 28
Lock ups, suggestions for..... 84
Logan, Dr. J. P., elected President of Atlanta Board of Health..... 37
London, effects of great fire on plague of 29
water supply, analysis of.....165
Louis Phillippe visits Nashville.....189
Louisville, Ky., cleanliness of 29
Lowlands of Nashville..... 40
Bowling's plan for improvement of... 40
Lowell, Mass., filtering gallery at.....167
Lower Silurian 148
Lowest temperature at Nashville..... 176
Lupton, N. T., Prof. in Vanderbilt University 214
investigations on Nashville water.....168
on drinking water 155
well and spring water 157
on water supply of Nashville 153
Lyster, Dr. W. F., distinction between sewers and drains 58
on drainage and health 52

M

Machinery, new pumping.....141
Machines, odorless emptying 34
Maddin, Dr. J. W., appointed on Sanitary Commission..... 94
Maddin, Dr. T. L., appointed on Board of Health for Third Ward..... 11
elected Vice President of Board of Health 12
Malaria and trees, Drake on..... 58
Maney, Dr. W. B., appointed on Board of Health for Fourth Ward..... 12
Manufacturing establishments of Nashville..... 95
Marling, J. L., death of 203
Marriages, registration of..... 20
Masonic Hall of Nashville founded.....203
Massachusetts, Adams on contamination of well water in..... 45
Campbell on registration of deaths in 18
Folsom on registration of deaths in... 17
in the lead in State Medicine..... 98
registration of deaths in..... 17
Report, extract from..... 51
warning by Dr. Boardman on increase of death rate..... 27
McAlister, Dr. J. W., assists Health Officer..... 81
McClellan, Ely, on cleanliness..... 30
on losses caused by yellow fever in Savannah 91
McEwen, John A., on intellectual progress of Nashville..... 96
McGavock, Dr. D. T., death of.....207
McMurray, Dr. J. W., appointed on Sanitary Commission..... 94
elected Secretary of Board of Health. 15
McNeill, Judge W., death of.....196
Medical attendance in Nashville, want of increasing the death rate..... 80
men of Nashville, charity of..... 71
men's work in State Medicine 87
Memphis, adoption of odorless machines in..... 36
African mortality in..... 24
assisted by Nashville..... 93
hurt by deafness to doctors..... 93
yellow fever in, facts connected with.. 92
Menees, Dr. Thomas, appointed on Sanitary Commission..... 94
Meteorological observations of Callendar 175
of Hicks.....175
of Lebanon.....176
of Signal Office 175
of Stewart 176
of Tavel 176
record of Nashville, '75, A. C. Ford..119
" " '76, " " ..128
Methods of purification of water.....160
Mexico, war with.....199
Michigan Board of Health on scarlet fever 73
in the lead in State Medicine in the West 98
laws of for contagious diseases..... 75
State Board of Health on drainage... 50
Middle Tennessee, health of early settlers in..... 47
natural divisions of.....147
Milwaukee, Wis., abattoirs about to be fitted up in..... 67
Miner, Dr. Thos. C., on vital statistics... 21
Mississippi, sediment of the..... 157
Mobile Ala., death rate of 25
organization of Board of Health in... 61
small-pox in 71
Mode of heating and lighting in Nashville, survey of.....109
Money panics..... 191
Monroe, President, in Nashville 191
Moore, Rev. T. V., death of.....209
Morgan, Col. S. D., Commissioner of new hotel 204
President of cotton factory.....209
public spirited citizen 95
Morrison, Dr. A., assists Health Officer.. 81
Morton, Dr. J. W., appointed on Board of Health for Fourth Ward..... 12
elected Health Officer..... 15
urges removal of Nashville workh'se 83
Mortuary statistics of Nashville, Currey on..... 50
in 1875, by ages 116
" by wards.....118
" cause of death.....111-114
" nativity.....119
" sex and social relations.....115
in 1866, by ages 125
" by wards.....126

Mortuary statistics of Nashville in 1876, cause of death....120–123
in 1876, nativity....126
" sex and social relation....124
Moses, the lawgiver, sanitary regulations of....30
Mount Olivet Cemetery laid off....203
Municipal lines, unscientific system of....22

N

Nash, General....187
Nashborough....187
Nashville, absence of public hospital in..78
account of, by Bailey....188
and Cleveland compared....32
African population of....23
a great educational center....215
amount of sewers of....140
" of water consumed in....141
artificial and Nashville natural must correspond....96
assists Memphis....93
assists Shreveport, La....93
banks chartered in....193
blind asylum opened....197
Board of Health. See Board of Health
resolut'ns on registrat'n of ozone..180
territory embraced in jurisdiction of....144
Brief Annals of, Nelson....183
causes of undue dampness in....48
census of. See Census.
centennial celebration at....210
charity of medical men of....71
character of water of, Foster on....141
cholera in. See Cholera.
churches in....212
churches built in....192
city government of....211
ordinance establishing Board of Health....16
workhouse....83
climate, influence of Cumberland river on....177
commerce of....95
construction of sewers of....139
cotton factory organized....209
Custom House began....210
country round....148
death rate in....22
diphtheria in....31
Dispensary, account of....76
establishment of....76
expenses of, 1875....77
" 1876....77
prescriptions filled, No. of, 1875....77
" " " 1876....77
rules of....76
salary of keeper of....76
duty of in regard to cholera....93
duty to be an exemplar of effects of preventive medicine....88
earthquakes in....196
elevation of....147
barometer at....119
epidemics in....93
epoch....148
events of war in....205, 206
excellence of climate of....176
facilities for drainage....133
Female Academy....199
financial crisis....194
fire alarm telegraph established....211
department of....211
fires in....194, 200, 203, 207, 208, 209, 210
first balloon ascension in....202
books printed in....190
church in....188
city government of....189
daguerreotyes in....195
Nashville, first death in....189
first divided into wards....192
grain elevator in....210
Legislature meets in....190
male child born in....187
marriage in....187
newspaper in....189
passenger train to....201
physician in....188
popular lectures in....195
public school in....201
settlement of....186
steamboat in....190
store in....188
survey of....187
taxes in....188
telegram received in....200
telephone in....212
water works....41
flat lands of....148
Ford on the climate of....171
future of....94
gas company chartered....200
heat of, Safford on....149
highest temperature of....176
House of Industry established....194
impositions on the charity of....79
incorporation of....190
Industrial exposition organized....208
intellectual influence of....95
" progress of, McEwen on..96
inspection of....64
Jewish Temple dedicated....210
latitude of....119
letter carrying introduced....205
local breezes at....175
" storms at....174
longitude of....119
lowest temperature at....176
lowlands of....40
Lunatic Asylum built....193
manufacturing establishments of....95
Maxwell House opened....207
Medical Society, action on cholera in 1866....11
Merchant's Exchange organized....211
meteorological record of for '75, Ford..119
" " '76, Ford..128
mistake in original plan of....55
mortuary statistics of, Currey on....59
for 1875, by ages....116
" by wards....118
" causes of death....111–114
" nativity....117
" sex and social relations...115
for 1876, by ages....125
" by wards....127
" causes of death....120–123
" nativity....126
" sex and social relations...124
narrow limits of, an anomaly....97
need of trees around....55
new hotel in....204
newspapers in....211
no sewers in....54
Normal and Theological Institute....215
Odd Fellows' Hall built....209
outside population an error....97
penitentiary built....193
perfected system of sewerage for....140
physicians, assistance rendered Health Officer by....81
population of....23
" in 1823....191
powder magazine explodes....197
prevention of sickness in....90
press, liberality of in sanitary matters 88
public schools of....213
railroad bridge made....206
rainfall at....179
registration of deaths in....19

Nashville rejects Constitution of United States.....188
relieves Pittsburg.....198
" starving Ireland.....199
" Vicksburg.....195
rocks of.....148
Sanitary Commission appointed.....94
" reform in.....9, 11
schools in.....213
schools for the blind.....216
secession in.....205
severe winters in.....176
should be a city, not a village.....98
situation of.....135, 173
small-pox prevented by action of Board of Health.....71
snow fall at.....179
spring water in, Safford on.....149
storm tracks affecting.....174
street cars introduced.....207
summary of sanitary survey of, 1877, bath-tubs, privies and drainage.....110
summary of sanitary survey of, 1877, character of houses.....108
summary of sanitary survey of, 1877, mode of heating and lighting.....109
summary of sanitary survey of, 1877, water supply.....109
surrender of.....205
suspension bridge destroyed.....205
" " rebuilt.....205
theater opened in.....201
topography of, Foster on.....133
undue share of expenses borne by in support of the State poor.....79
University Hospital.....78
use of well water in.....42
vaccination in.....72
value of University and other parks around.....55
water, animalcules in.....168
" Lupton's investigations on.....168
" natural filtration of.....142
" Safford on.....148
" supply of.....41
" " Lupton on.....153
" " proposed changes in..141
" works of.....141
" " description of.....193
wire bridge built.....200
National Prison Congress.....83
Nativity of Nashville dead in, 1875.....117
" " " 1876.....126
Natural waters, source of.....156
Nature of impurities in water.....158
Nelson, A., Brief Annals of Nashville.....183
note by.....185
Secretary of Tenn. Hist. Society.....209
New England Journal of Education, views of.....68
New Haven, Ct., Lindsley on the inspection of.....11
Newnan, Dr. J. C., appointed on Board of Health for Second Ward.....11
elected President of Board of Health 12
New Orleans, La., abattoir established in 66
adoption of odorless machines in.....37
death rate of.....25
Fenner's measures disregarded.....93
hurt by deafness to doctors.....93
immunity from yellow fever during U. S. army occupation.....93
New York, abattoir established in.....67
Academy of Science, report to on fish-like odor of water.....168
action of Board of Health on fills.....41
adoption of odorless machines in.....37
amelioration of death rate in.....28
area of.....97
Chandler on use of well water in.....43
fills in, increasing death rate.....40
New York, hospitals erected by private charity in.....79
Nichol, Prof., report on Boston water.....168
Nichol, Dr. W. L., appointed on Board of Health for Third Ward.....11
assists Health Officer.....81
Night soil question, Atlanta report on.....37
Norfolk, Va., adoption of odorless machines in.....37
Normal school in Tennessee.....212
Norris, Dr. J. B., on death rate of Chattanooga.....24
Norvell, Joseph, death of.....199
Notables, government of.....187
Nottingham, Dr. C. B., on hygiene of schools.....70
Nowlin, Dr. J. B. W., elected member of Board of Health.....15

O

Odorless machines.....34
adoption of in Alexandria.....35
" " Baltimore.....35, 37
" " Boston.....35
" " Brooklyn.....37
" " Charleston.....37
" " Chicago.....37
" " Cleveland.....36
" " Detroit.....37
" " Georgetown.....37
" " Grand Rapids.....37
" " Jersey City.....37
" " Memphis.....36
" " New Orleans.....37
" " New York.....37
" " Norfolk.....37
" " Pawtucket.....37
" " Philadelphia.....35
" " Providence.....37
" " Richmond.....37
" " Savannah.....37
" " Washington.....37
approved by Boards of Health.....34
introduced into Baltimore.....33
Ogden, John, President of Fisk University.....215
Organic impurities in water.....158
Organic matter in water, chemical determination of.....164
Frankland's method of determining..164
Wanklyn's method of determining...164
Orthis bed.....151
fossils of.....151
Our source of supply of water.....161
Overflows of Cumberland River.....177
Ozone, observations on.....180
registration of amount of in atmosphere.....180
registration of, resolutions of Nashville Board of Health on.....180
registration of, Washington authorities on.....180

P

Paris, amelioration of death rate in.....28
Tardieu on nuisances of.....32
Pasteur, M., on Germ Theory.....31
Paul, Isaac, death of.....210
Pawtucket, adoption of odorless machines in.....37
Pearl, J. F., Superintendent of public schools.....213
Penitentiary, mutiny in the.....207
Pits, improvement in.....34
in Nashville.....33
water tight.....34
Pittsburg, rigid inspection system in.....61
Philadelphia, Pa., abattoir established in.....67

Philadelphia, adoption of odorless machines in ... 35
cleanliness of ... 28
cost of small-pox epidemics in ... 91
history of, a warning and guide to Nashville ... 97
inspection of ... 63
report on odorless machines ... 35
report, quotations from ... 34, 35
Physical education, necessity of ... 69
Physicians, dependence of Nashville on her ... 94
duties of to the public ... 75
Physiology in schools, elementary, Huxley on ... 70
Plague of London, effects of great fire on 29
Playfair, Dr., on ratio of death and sickness ... 90
Plunkett, Dr. J. D., appointed on Board of Health for Sixth Ward ... 12
appointed on Sanitary Commission ... 94
elected Chairman of Sanitary Commission ... 94
elected President of Board of Health 14
" Secretary of Board of Health 12
resolutions of ... 71
Poindexter, George T., death of ... 204
Polk, President J. K., death of ... 200
Pool, Dr. T. F. P., appointed on Sanitary Commission ... 94
Poor, attention to the sick ... 76
Population of Nashville ... 23
in 1823 ... 191
Potable water, fish-like odor of ... 168
Prevention, direct, of disease ... 70
of dampness ... 50
of dangerous classes better than cure 82
of sickness in Nashville ... 90
Priestly, James, President of University of Nashville ... 212
Prison reform needed ... 82
Prisoners, care of ... 82
Privies in Nashville ... 110
Proposed changes in water supply of Nashville ... 141
Prostitution, legalization of ... 72
Providence, R. I., adoption of odorless machines in ... 37
Public enlightenment ... 85
Smith on ... 87
Pure water ... 157
Purification of water by filtration ... 161
by settling ... 160
methods o ... 160
Putnam, A. W., death of ... 208
Vice President of Tennessee Historical Society ... 200

Q

Quinine introduced in Nashville by Dr. Robertson ... 192
Quintard, Bishop C. T., on hygiene ... 11

R

Rain water ... 157
fall at Nashville ... 159
fall, Hicks on ... 179
fall table, 1875 ... 179
" 1876 ... 179
Rains, John, first settler ... 186
Ramsay, Dr. J. G. M., President of Tennessee Historical Society ... 209
Ratio of death and disease, Playfair on . 90
Rauschenberg, C., on Sanitary Commission of Atlanta ... 36
on sewage and drainage ... 37
Reese, Dr. W. P., on inspection of Selma 63
Registration of deaths and sanitary progress ... 17
Registration of deaths in England, Folsom on ... 18
deaths in Massachusetts, Campbell on 18
" " Folsom on ... 17
" Nashville ... 19
" practical value of ... 19
marriages and births ... 20
Removal of filth ... 29
human excreta ... 32
Reservoir ... 141
capacity of ... 141
new ... 142
water, analysis of ... 161, 162, 163, 165
fish-like odor of ... 169
variations in ... 165
Responsibility of public officers ... 90
Stein on ... 90
Richmond, Va., adoption of odorless machines in ... 37
death rate of ... 24
inspection of, Cabell on ... 63
requirement of law on gutters ... 49
River of highlands ... 147
River water ... 157
Robertson Association ... 79
work of in Nashville cholera ... 93
Robertson, Duncan, a public spirited citizen ... 79
death of ... 194
Robertson, Dr. Felix, first male child born in Nashville ... 187
introduces quinine in Nashville ... 192
Robertson, Gen. James, death of ... 190
first settler ... 186
soldier and Statesman ... 98
Rochester, fish-like odor of water in ... 168
Rocks of Nashville ... 148
Royal Commission of Great Britain on drinking water ... 155
Rush, Dr. Benjamin, on epidemics ... 91
Rutledge, Hon. H. M., death of ... 196

S

Safford, Dr. J. M., on heat of Nashville 149
on spring water of Nashville ... 147
on topography and geology of Nashville ... 145
Professor in Vanderbilt University ... 214
on water of Nashville ... 148
Sanitarian of Bell ... 51
Sanitary Code, suggestion on formation of ... 89
Commission appointed in New York ... 94
" created in Atlanta ... 36
reform in Nashville ... 9, 11
regulations of Moses ... 30
science, British legislation on ... 29
survey of Nashville, 1877. Bath-tubs, privies and drainage ... 110
survey of Nashville, 1877. Character of houses ... 108
survey of Nashville, 1877. Mode of heating and lighting ... 109
survey of Nashville, 1877. Water supply ... 109
value of trees, St. Louis report on ... 58
Sappington, Dr. John, first physician in Nashville ... 188
Saudek, Dr. J., appointed on Sanitary Commission ... 94
Savannah, Ga., adoption of odorless machines in ... 37
losses caused by yellow fever in ... 91
Scarlet fever ... 72
attendants should not mix with the family ... 74
Baker on ... 73
bed linen should be disinfected ... 73
body linen should be disinfected ... 73
cleanliness of nurses enjoined ... 74

Scarlet fever. Clothing, carpets, etc., should be destroyed 75
communication of 73
discharges dangerous 73
" should be disinfected 74
disinfection of room and contents in, 74
filth increases danger of 73
fresh air should be had in 76
funerals should be private 74
gaseous disinfection in 74
handkerchiefs should be destroyed... 73
heat as a disinfectant in 74
infected substances not destroyed should be subjected to a dry heat of 250° F 75
isolation of cases 75
length of time for disinfecting by gas 74
management of sick room in 73
persons recovering should be considered dangerous 74
public shou d be not fied of cases..... 75
restriction and prevention of, Michigan Board on 73
separation of patients with 73
time of communication of 73
Schiff, Dr. G., appointed on Sanitary Commission 94
School Inspector and Lecturer on Hygiene, suggestions for a 69
School room and surroundings, Brock on hygiene of 69
Schools, Huxley on physiology in 70
in Nashville 213
inspection of 68
Nottingham on hygiene of 70
Scott, Sir W., advice on tree planting..... 57
Schuylkill water, analysis of 163
Section of Nashville beds of limestone ...149
Sediment of Mississippi 157
Seine water, analysis of 163
Selma, Ala., death rate of 25
Reese on inspection of 63
Settling, purification of water by 161
Severe winters at Nashville 176
Sewerage and drainage, Barrett on 53
distinction between, Lyster on 53
Ranschenberg on 37
Sewerage, perfected system of for Nashville 140
Sewers and drains, difference of 39
Sewers of Nashville, amount of 40
construction of 140
Sex and social relations of Nashville dead, 1875-76 ..... 115, 124
Shelby, Dr. John, death of 203
Shreveport, La., assisted by Nashville ... 93
Sickness in Nashville, pecuniary loss of.. 90
Sieferle, Frank, custodian of Nashville dispensary 77
Signal office meteorological observations 175
Signal service U. S., value of 181
Simons, Dr. Manning, report on Board of Health in Charleston 15
report on city physicians of Charleston 15
report on hygiene and State medicine 87
Slops and garbage, effects of compliance with ordinance respecting 39
Slops, careless disposal of, a cause of disease 38
an evil of the highest magnitude 38
removal of 38
Small-pox 71
as an epidemic, the result of neglect, 71
epidemics, Lee on cost of 91
in Mobile, result of abolition of the Board of Health 71
in Nashville, prevented by Board of Health 71
Smith, General E. Kirby, Chancellor of University of Nashville 213
Smith, Gowverneur M., on public enlightenment 87
Smith, John Hugh, death of 208
Smith, Dr. Stephen, on value of trees..... 57
Sneed, Dr W. J., appointed on Sanitary Commission 94
assists Health Officer 81
Snow fall at Nashville 179
Somerville, John, death of 199
Soule, Bishop, death of 207
Source of natural waters 156
Spence, A. K., Pres't of Fisk University 215
Spring water in Nashville, Safford on 149
Lupton on 157
St. Bernard's Academy 214
St. Cecilia's Academy 214
St. Cloud Hill 136
St. Louis, Mo., abattoir urged in by Barrett 67
cleanliness of 29
death rate in 16
healthiness of 29
opposition to reform in 85
professional board of 16
report on sanitary value of trees..... 38
workhouse, Eliot on 83
St. Mary's School 214
State Library, value of as a collection... 51
State Medical Society of Alabama on hygiene 87
State Medical Society of Tennessee on hygiene 87
State medicine, duty of medical men in furthering 87
Statistical tables 101
Statistics of city patients in University Hospital for 1876 103
of Workhouse for 1876 104
vital, for 1876 104
Stearns, E. S., Chancellor of University of Nashville 213
Stein, Albert, constructs first water-w'ks in Nashville 41
far-sighted citizen 95
Steiner, Dr. L. H., on responsibility of health officers 90
Stench-traps 140
Stewart, Alex. P., meteorological observations of 176
Stewart, Dr. J. A., on contamination of well water in Baltimore 43
Stephens, Alex., on growth of inland cities 91
Stockell, Capt. W., chief of fire dep't.....211
Storm tracks affecting Nashville 174
Storms, local, at Nashville 174
Stout, Dr. J. W., appointed on Sanitary Commission 94
Street sprinklers introduced in Nashville 204
Sturtevant, J. M., Pres't of the School for the Blind 216
Sulphur Spring 186
Sulphurous acid gas, receipt for generating 74
Supply of water, our source of 161
Suwanee Indians 186
Syphilis 72
blighting effects of 72
checked by segregation 72
Gross on regulation of 72
Sims on hygienic regulation of 72
Syracuse water, analysis of 163
System of sewerage for Nashville perfected 140
Systematic inspection 60
rules and objects of 60

T

Taliaferro, Dr. V. H., elected Secretary of Atlanta Board 37
Tannehill, Wilkins, address of.....191
death of.....203
receives LaFayette 192
Tardieu on the nuisances of Paris..... 32
Tavel, P. F., meteorological observations of 176
Telephone, first in Nashville.....212
Temperance National Association, meets in Nashville 205
Temperature, highest in Nashville 176
lowest in Nashville.....176
Tenement houses, need of regulation of. 54
Tennessee Code, imperfections of in regard to coroners 21
Tennessee, duty of as an example in State medicine..... 99
Tennessee Historical Society reorganized 200, 209
Tennessee, penal legislation of, needs overhauling..... 82
Territory embraced in jurisdiction of Nashville Board of Health.....144
Thames water, analysis of.....163, 165
Thruston, Gen. G. P., Cor. Sec'y Tenn. Historical Society.....209
Topography and Geology of Nashville, Safford on.....145
Topography of Nashville, Foster on 133
Travellers and climate 181
Trees aiding in the supply of pure air 55
and parks..... 55
avenues of, Everett on 56
Drake on malaria and..... 58
ideas of ancients in regard to 56
importance of planting in the wards.. 56
need of around Nashville..... 56
planting of, Cabell urges the..... 58
" Cicero on 57
" Scott's advice on..... 57
sanitary value of, St. Louis report on 58
Smith on the value of 57
Troost, Dr. G., death of.....201
Tucker, Dr. N. G., assists Health Officer 81

U

U. S. Report on Cholera Epidemic of 1873, extract from..... 31
University and other parks, value of, around Nashville..... 55
University Hospital, statistics of city patients in.....103
University of Nashville, history of 212
presidents of.....212

V

Vaccination in Nashville..... 72
Value of University and other parks around Nashville..... 55
Value of U. S. Signal Service.....181
VanBuren, President, visits Nashville ...196
Vandeman, Dr. J. H., on death rate of Chattanooga 24
Vanderbilt, Cornelius, munificence of....213
Vanderbilt University, account of.....213
professors in 214
situation of 138
Variations in Judge's Spring water.....166
in Reservoir water.....165
in Wilson's Spring water.....166
Virchow, Prof., on germ theory..... 31
Virginia Transactions Report..... 87
Vital statistics, Minor on 21

W

Walker, Gen. Wm., a Nashville man, declared President of lower California 202
Wanklyn & Chapman on water analysis..166
Wanklyn's method of determining organic matter in water 164
Ward, W. E., seminary of.....214
Warnings of the dea h rate 26
Water, Albany, analysis of 103
amount consumed in Nashville.....161
analysis, a complete..... 164
" of Nashville, compared with other cities.....163
analysis, Wanklyn & Chapman on.....166
animalcules in Nashville.....169
Boston, Nichols' report on 168
British Commission on zymotic diseases propagated by 160
chemical determination of organic matter in 164
chlorine in.....166
Clark's plan for softening hard 164
closets in Nashville..... 33
Cochituate, analysis of 163
Croton, analysis of 163
Cumberland River, favorably compares with others 163
deleterious effects of impurities in.....158
Farion on fish-like odor of 168
filtration a remedy for fish-like odor of.....170
fish-like odor of Reservoir 168
" " Rochester.....169
Frankland's method of determining organic matter in.....164
hard, British Commission on 159
hardness of 163
" removed by boiling 163
inorganic impurities in.....138
Judge's Spring, analysis of..... ..... 162, 163, 164, 165
Judge's Spring, variations in 166
Kent Company, analysis of 165
Lake Michigan, analysis of.....163
Lattimore on fish-like odor of.....168
Letheby on wholesomeness of hard...164
London Water Supply, analysis of....165
Methods of purification of 160
Nashville, Foster on character of.....141
" Lupton's investigations of..168
" natural filtration of.....142
" Safford on 148
natural source of 156
nature of impurities in..... 158
organic impurities in.....158
our source of supply of.....161
potable, fish-like odor of 168
pure.....157
purification of by filtration 160
" " settling 160
rain 157
Reservoir, analysis of...161, 162, 163, 165
" variations in 165
River.....157
Royal Comm'n of Great Britain on...155
Schuylkill, analysis of 163
Seine, analysis of.....163
spring, Lupton on.....157
supply..... 41
" importance of.....155
" of Nashville, Lupton on.....153
" " means for perfecting 41
" " proposed changes in..141
" to houses, survey of, 1877.....109
Syracuse, analysis of.....163
Thames, analysis of 163, 165
Wanklyn's method of determining organic matter in.....164

Water, well, British Commission on.....158
" " Lupton on.....157
Wilson's Spring, analysis of.....
..... 161, 162, 163, 165
Wilson's Spring, variations in 166
works of Nashville 141
" " built.....193
" " extension of a wise
decision of the people..... 89
Washington, D. C., adoption of odorless
machines in..... 37
authorities, action on ozone registra-
tion 180
Waste water from hydrants 48
Watkins' Park..... 59
Watkins, Samuel, a public-spirited cit-
izen 59
presentation of a park to the city..... 59
Weakley, Robert, death of.....197
Wells and cholera 46
Wells, Frank, on contamination of well
water in Cleveland 44
on filth and disease..... 31
on oderless machines..... 36
Wells, poisoning of, explained by geolog-
ical character..... 47
Well water, Adams on contamination of
in Massachusetts 45
British Commission on 158
causes of pollution of..... 42
Contamination of in Cleveland, Wells
on 44
Derby on contamination of..... 45
in Baltimore, Stewart on contamina-
tion of..... 43
in cities not potable 42
in New York, Chandler on..... 43
Lupton on 157
use of, in Nashville..... 42
Winsor on contamination of..... 45
Wesley, Dr. axiom of, on cleanliness..... 47
Wharton, Dr. W. H., death of.....208
Whig Convention.....195
White, Hugh Lawson, death of.....195
Wholesomeness of hard water, Letheby
on 164
Willard, Assistant Marshall, condemns
vegetable food 65
Williams' City Directory.....185
Williams, Dr. C. J. B., on bad drainage 30
Wilmington, Del., adoption of odorless
machines in..... 37
Wilson's Spring Branch..... .....135, 136, 138
Wilson's Spring water, analysis of.. .....
.....161, 162, 163, 165
variations in.....166
Wines, Dr. E. C., on national prison
work 83
Winchell, Dr. A., professor in Vander-
bilt University.....214
Winsett, Dr. W. D., assists Health Officer 81
Winsor, Dr. F., on contamination of
well water 45
on damp cellars..... 52
on disease and filth..... 30
Winston, Dr. C. K., appointed on Sani-
tary Commission 94
suggestion of a Board of Health..... 11
Winston, Dr. J. D., appointed on Board
of Health for Fifth ward 12
Workhouse, a model, looked for in Nash-
ville 83
of city of Nashville 83
of St. Louis, Eliot on 83
statistics for 1876 104
Wyatt, T., Sup't of Water-works.....107

Y

Yater, W. H., Capt'n of Police in Nash-
ville 83
Yellow fever, checked in Mobile by rigid
inspection..... 61
in Memphis..... 92
" aid rendered by associa-
tions for..... 92
in New Orleans, banished during mil-
itary occupation 93
losses caused by in Savannah, Mc-
Clellan on..... 91
Young ladies' schools in Nashville,
Blackies'.....214
Ward's.....214
Young Men's Christian Association, good
work of..... 83

Z

Zymotic diseases enumerated..... 31
propagated by water, British Com-
mission on 160

LANE MEDICAL LIBRARY

To avoid fine, this book should be returned on or before the date last stamped below.